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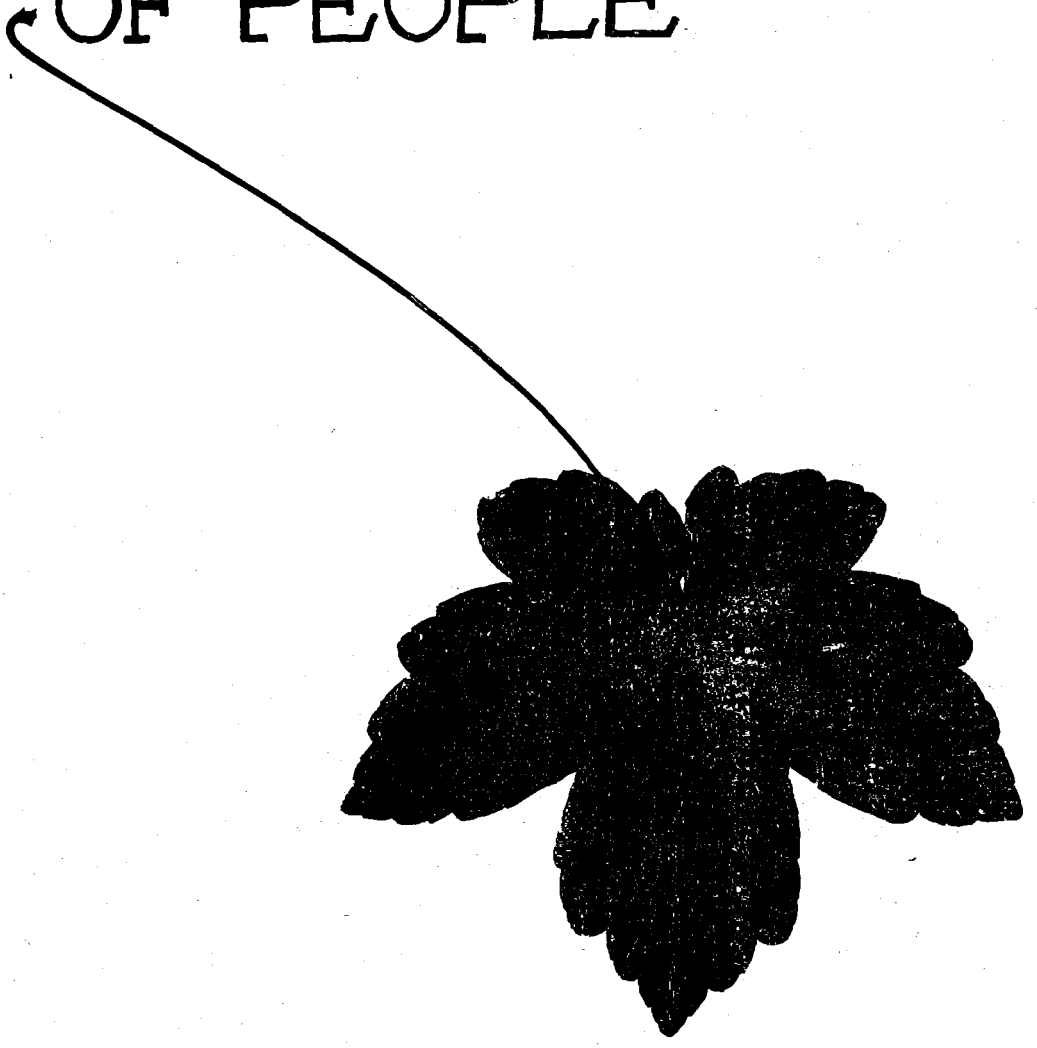
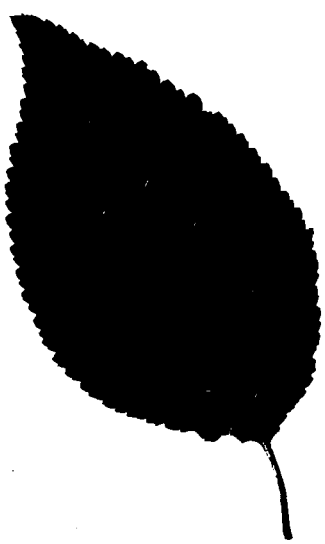
THE PSYCHOLOGICAL EFFECT OF PLANTS ON THE WELL-BEING OF PEOPLE





A dissertation submitted in partial fulfillment of the requirements for the Diploma of Landscape Architecture in the University of Canterbury.

SARABELL, LINCOLN COLLEGE, 1988.

SPECIAL THANKS:

KEVIN BELL	EDITOR MY DAD
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INTRODUCTION

INTRODUCTION

Landscape Architecture is a discipline whose basic aim may be defined as the act of arranging land and the objects upon it for human use and enjoyment. Utilising both the arts and sciences in planning, design and management of the landscape. This suggests that landscape architecture operates in the realm of "people nature" relationships.

An arbitrary division of people/nature is reinforced in this technocratic age of the megalopolis where the power of people to contest, conquer, dominate and remodel vast tracts of wilderness can be seen in the urbanisation and manipulated landscapes of today.

It is at this time of rapidly diminishing natural settings that we see a growing concern for environmental issues with much study devoted to nature and people and documentation on the surcease sought through more intimate contact with areas of naturalness particularly greenness.

Greenness, vegetation, plants are considered one of the basic materials of the landscape architect, the "software" as opposed to the structural components of building and engineering or "hardware". Plants have blanketed much of the landscape and are thus a universal resource. The use of plants by the landscape architect should match an understanding of what they achieve and should not be based merely on assumptions and personal appreciation. Establishment of principles and guidelines for judgements about the value of the landscape other than for physically supplying human needs is required and a useful categorisation of approaches to plant use with respect to landscape would be beneficial.

Landscape architecture has appeared to accentuate in its site planning, masterplanning, landplanning, environmental engineering and landscape management the visual appeal. Visual perception as a subject has attracted a plethora of literature and is considered the sense most relied upon by people. It is not, however, the only way in which people gather information from their

environment. Indeed other forms of sensory reception:-

hearing

smell

taste

and touch

are all important in shaping behavioural responses.

These sensations cannot be studied independently of perception, cognition and other aspects of human experience which lend to memories, associations and influence emotions.

Design, in order to be successful, must take into account the individually learnt conditioning of a person encountering a dynamic system of stimulus. It must also recognise culturally and socially imbued and genetically inherited conditioning.

Psychology studying behavioural responses of the individual or group may proffer a crucial understanding of the people nature transaction and provide a theoretical base upon which to found plant use.

The direct effect plants have on humans is that humans can see, smell, hear and be touched by plants. Through the senses there is an experience and experience is gained through and adds to perception. If we accept that perception is not just neutral then the presence of plants could be an influencing factor to well-being and the absence of plants could be a contributing factor to ill-being. There is an effect quite beyond the direct sensing which, arising from experience and a persons background and nature, is psychological and can be guaged.

OUTLINE

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CHAPTER 1

PERCEPTION AND PSYCHOLOGICAL METHODOLOGIES

- an introduction to the field of perception and the science of psychology.

CHAPTER 2

HISTORICAL REVIEW OF THE PLACE OF PLANTS TO PEOPLE

- a brief look at the symbolic representation of plants with emphasis on the tree by peoples throughout the ages.

CHAPTER 3

CULTURAL APPRECIATIONS OF PLANTS

- a selection of the considered two main cultural identities of Aotearoa New Zealand, the traditional Maori and the non Maori of western european origin and their different conditioning and responses to vegetation.

CHAPTER 4

SOCIAL RESPONSE TO PLANTS

- a report on some of the community responses to Garden Beautiful projects in their area and suggestion of possible social benefits of nature in urban areas.

SECTION TWO

EXPERIMENTAL CASE STUDIES

CHAPTER 5

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- current research and findings of a physically passive response of people and plants.

CHAPTER 6

CRITIQUE OF CURRENT PASSIVE METHODOLOGIES

- critical appraisal of the employed methods of testing of environmental influence on peoples psyches.

CHAPTER 7

ACTIVE PEOPLE/PLANT TRANSACTION

- current research of the psychological benefits to people of active participation with plants in gardening and the wilderness experience.

CHAPTER 8

PLANTS AS A SOURCE OF SENSORY STIMULATION

- a study of some of the components of plants and their possible effects of the persons psyche.

FINAL NOTE AND CONCLUSION

SECTION 1

CHAPTER 1

PERCEPTION AND PSYCHOLOGICAL METHODOLOGIES

In this chapter psychological effects are gauged in terms of the human behavioural response. Thus the plant person interrelationship is considered a stimulus response one. These psychological effects are shown to be closely affiliated with the persons perceptions of plants through the senses, emotive responses and the accumulation of such into associations and memories.

The responses to plants cannot be easily segregated from those to nature in general. Practiced methods of psychological testing pertinent also to sociology are suggested as a basis to determine possible beneficial effects of plants.

'To me a tree is more pleasing than a man' Beethoven.

CHAPTER 1 PSYCHOLOGICAL EVALUATIVE TECHNIQUES

Work has been done in various fields and commentators have written specifically on plants and various values plants are shown to have in the human condition. However most of this work relates to fields of utility where plants are studied;

A in their productive capacity as

i) food producers

ii) timber producers

iii) fuel producers

iv) or producers of other useful materials such as medicines, resins, perfumes, rubber oils and the like

B in their technical capacity

i) erosion control

ii) flood control

iii) shelter etc

There is widespread application of the use of plants in a non technical way for which there is little literature or study apparent to find a base upon which such applications could be rationalised (with the exception of visual aesthetics).

There has been recently an endeavour to determine if in fact there are preferences by people for certain environments. This sort of research engages the science of psychology in stimulus/response testing. Such studies involve human sensory reception and perception.

PERCEPTION

All environments evoke feeling

Environmental Aesthetics (1982)

This study is immediately concerned with that area of perception of the effect which is beyond mere sensory experience into that which elicits a mental response short of considered cognition.

While it may be seen as an arbitrary distinction which cannot be empirically tested many experts consider on rational grounds that sensations are simple neural events, and

Perception is a process whereby sensory stimulation is translated into organised experience. That experience or percept is the joint product of the stimulation and the process itself.

This perceptual process is believed to be part of an individuals make-up and is not directly observable except to the perceiver themself whose percepts are given directly in experience. So perceptual theory and its validity can only be checked indirectly often through experimental research and comparison with collected empirical data.

percepts are more complex and identified with the brain and cognition a more complex association of perceptions and experience past and present.

It is important to remember that perceiving is subject to the influence of past experience and learning, whereas sensation is generated by a particular stimuli which is subject to changes due to change in sensitivity.

There is a danger when dealing with perception to rely too heavily on visual aesthetics. A recent flourish in writings has produced a number of carefully devised visual impact assessment models to determine peoples response to design proposals. This has had some influence from the way of life of modern societies heightening importance of vision over other senses. However, it is singular in approach to human perception which necessarily involves more than one mode of sensory stimulation.

The physical world is what one sees, but it is also the foundation and context for that seeing.

Environmental Aesthetics (1982)

There are many assumptions all of which are to do with the persons valuing what the senses present. There is discussion as to whether the value is inherent in the object which is experienced, or whether the object is neutral and the value is applied by the subject through a range of previous experiences. Further, the relating of object to experiences of other objects and where the object studied stands in relationship to those other objects is all a part of the perceptual process.
There is an awareness that nature and the natural environment, greenness, wildland, landscape or the various names given to nature, as against man-made or artificial, has a value. There is no clarity as to where this value lies. Most of the studies and comment available deal with -

nature in the raw

or

the natural state of things altered a little by human intervention

or

the artificial environment that people have created for themselves in urban centres.

There has been division of the environment into various units by investigators to assist them to some understanding of where particular values might exist. To take plants as one of

the units creates a possible trap in that, at least from the ecological viewpoint it isolates an aspect in an ecosystem, in which all units including people themselves, are a part and a participant. There is a validity in the study because all environmentalists accept that in either looking at objectively an environment of high quality, vegetation is integral, and in repairing an environment, which is found for one reason or another to be lacking in quality, vegetation is used as an important salve. This has no acceptable foundation without an underlying guess that there is a considerable effect of plants on the psychology of people.

This study being concerned quite specifically with peoples perception of plants has prompted difficulties in how to approach theoretical evaluation of any worth. Most writing has been in the wider context of people/nature interactions, there being little dealing with people/plant interactions. Even so, such documentation has not yet been adequately distilled, and a number of categories underwhich judgements have been made are seen to be disclosed.

There is however one exposition of interest by (Zube Sell Taylor), which, after much discussion on a varied selection of recent literature concerned with perceptual analysis proposes four categories into which the writings fall.

A. That which is produced by the skilled and trained observer. Such observers from their education and training in resource management techniques with skill in art, design and in ecology can usefully proffer judgement. Normally in more technical disciplines such as geography and town planning, these observers would leave the aesthetic and less tangible judgements as implicit in their works.

B. A second category proposed involves general assessment through testing general public on selected populations evaluations of landscape aesthetic qualities or of specific landscape properties. The external landscape properties are assumed to bear a correlational or stimulus/response relationship to observer evaluations and behaviour.

C. A third category proposed involves a search for human meaning associated with landscapes or landscape properties. This predicates a mental reflection upon information by an observer and allows in that

reflection consideration of past experience, future expectation and the observers socio-cultural conditioning.

D. The fourth and final category considers landscape values to be based on the experience of the human landscape "<u>interaction</u>". In this category it is the intervening participants and the action of people to develop aesthetic quality which is important and this contains an awareness of group relationships.

Experience has taught us that what a thing is, is often of less importance than our relationship to the thing.

John Simmonds (1961)

e.g. Japanese cultural predilection for the simple ordered detailed object for study and contemplation.

In endeavouring to seek psychological effects it is found from this appraisal inadequate to remain limited to the second category. And psychological response is to an extent limited by all four of the suggested categories, at least in many of the observers.

	EXPERT	PSYCHOPHYSICAL	COGNITIVE	EXPERIENTIAL
HUMAN MODEL	ELITE, HIGHLY-SKILLED TRAINED OBSERVER	OBSERVER AS RESPONDENT	OBSERVER AS PROCESSOR	ACTIVE PARTICIPANT
LANDSCAPE PROPERTIES	FROM PRINCIPLES OF ART, DESIGN, ECOLOGY, AND RESOURCE MANAGEMENT: FORM BALANCE CONTRAST CHARACTER DIVERSITY ECOLOGICAL PRINCIPLES DIVERSITY SILVICULTURE TIMBER STAND IMPROVEMENT POLLUTION CONTROL	SPECIFIC LANDSCAPE PROPERTIES MANIPULATABLE THROUGH MANAGEMENT AND DESIGN: LAND WATER TOPOGRAPHY STRUCTURES	ASSOCIATED WITH OBTAINING INFORMATION AND MEANING: MYSTERY LEGIBILITY IDENTIFIABILITY PROSPECT REFUGE HAZARD	WORLD OF EVERYDAY EXPERIENCE: FAMILIARITY SOCIAL SCALE LANDSCAPE STYLE
INTERACTION OUTCOMES	STATEMENT OF LANDSCAPE QUALITY ENHANCED SENSE OF LANDSCAPE	NUMERICAL OR STATISTICAL EXPRESSION OF PERCEIVED VALUES RELATED LANDSCAPES OR LANDSCAPE FEATURES	MEANING RATINGS OF SATISFACTION DISSATISFACTION AND PREFERENCE ADAPTATION AROUSAL	HABITUAL BEHAVIOR UNDERSTANDING OF HUMAN AND LANDSCAPE DEVELOPMENT CHANGE STATEMENTS OF LANDSCAPE TASTE ENHANCEMENT OF SENSE OF SELF

RELATIONSHIPS OF MODEL ELEMENTS AND LANDSCAPE PERCEPTION PARADIGMS

ZUBE, SELL & TAYLOR (1982)

In this discussion we seek to gain understanding of what the presence or absence of plants may mean to the person. As there is little apparent direct physical effect we utilise the science of psychology to provide a sound theoretical base from which to measure any possible psychological effects.

PSYCHOLOGY

Psychology is a science devoted to the understanding of the nature, function and phenomena of the human mind and soul. It's expressed generally in the study of human behaviour because it's the human behaviour which is the observable working of the human person.

Psychologists themselves have evolved various approaches to understand the nature of the person. The recognition of their own influence, understanding and possible bias gives rise to and determines different methodologies. The human individual can

a. respond to particular stimuli, which, an outsider can observe

b. respond to particular stimuli, which, an outsider can actually manipulate, create and put in front of the individual in order to see what the response will be.

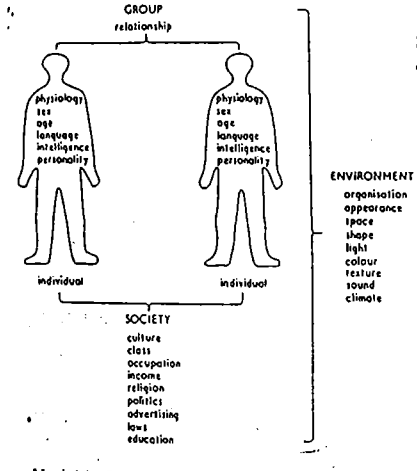
The study of individuals is thus variously set in different contexts. The psychologists testing methods or underlying assumptions can affect the result. This should be kept in mind.

People may be categorised into:

cultural groups
age groups
occupational groups
activity groups
socioeconomic groups
etc.

and whether the person is considered as an individual or a member of a group all effect the outcome of an experiment. Just as people may be grouped and looked at in different contexts so to may the creation and imposing of the stimuli be divided into various branches under the umbrella of psychology. Thus we have today

clinical psychology
environmental psychology



Variable factors of the human psyche

IRWIN, D. (1987) pp35

industrial psychology
etc

and writings on psychology for various disciplines.

Although drawing on the science of Psychology this dissertation is quite specific in seeking answer to quite a particular question, that of whether there is a psychological effect on people by plants. There has been widespread belief as to the beneficial effects of plants and this study is concerned with such effects and peoples well being.

Psychology has not developed many sophisticated and certainly not foolproof methods and techniques whereby definition and valid generalisations to this particular topic can be gained. To limit this dissertation to the discussion of the methodology, its application and its result cannot at this stage of the development of the science be as simple and clear cut as that. Any direct technique to guage the effect of plants on people would be supplemented by experimental knowledge and known cognitive response. In resorting to these areas it must be remembered that even the basis upon which the experts in the field are trained to carry out and apply such method is influential on outcomes.

There is, thus, difficulty in deciding what method can be applied to give any understanding of the psychological effects of plants on people.

The engagement of certain psychological techniques offer methods by which landscape architects may monitor their own areas of interest. An overview of current possible techniques discloses the following methods as being in use:-

a. Observation and Experiment:

Direct observation with no effort made to control the behaviour under study is the simplest way to gather data.

Experimental method adds control over the observations and permits manipulation. Physiological changes can be measured and are used under this method.

b. Introspection and Questionnaires

Verbal or written reports of experience from subjects is used, where some rigour

is applied.

By averaging repeated introspective observations the effects of incidental fluctuations diminishes.

Questionnaires of various sorts are used in this approach to studies of attitudes. There are difficulties where people wish to hide their feelings or have inability to communicate.

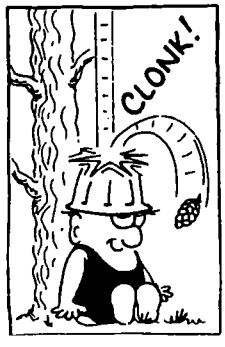
c. Interviews

A subject encouraged to talk at length about their attitudes guided by questions from interviewers can yield more information than simple questionnaires and are increasingly used in surveys of public opinion. This technique requires a widely representative sample of people.

d. Testing

Psychometric tests as a tool used by psychologists sampling behaviours help comparison of individuals on a relatively standardised basis.

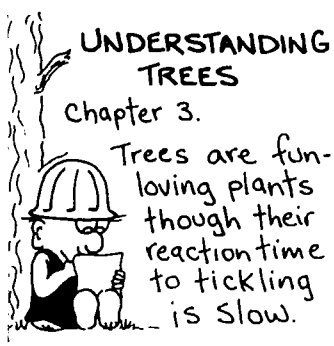
Their use is particular to aspects of psychology which are not relevant to this dissertation.



e. Laboratory Work

Modern psychological laboratories are established with a variety of hardware. This is a more specialised aspect of testing which inhibits normal sponteneity and in a specialised way only would provide information relevant to this study.

Of these most are designed not so much for the purpose of guaging the effect of stimulus for well being or otherwise but for promoting response that will give an insight into the nature of the mind and its workings. There are, however, among them techniques which have been usefully used and which will be discussed in following chapters.



CHAPTER 2

HISTORICAL REVIEW OF THE PLACE OF PLANTS TO PEOPLE

Much can be gleaned about a people through evidence they leave behind from archeological siftings to writings and paintings, customs and traditions.

It is through research based on observations and such evidence that hypothesis are formulated and subsequently subjected to scientific testing.

This chapter provides a brief review of the place of plants in human history as background to more recent scientific studies in the area of relationships between people and nature particularly plants.

Is there any psychological effect at all? Are plants or vegetation merely a background in the environment which is perceived as neutral so that it's presence is of little concern?

CHAPTER 2

HISTORICAL REVIEW OF PLACE OF PLANTS TO PEOPLE


Caveman was a nest builder

By JENNY REES

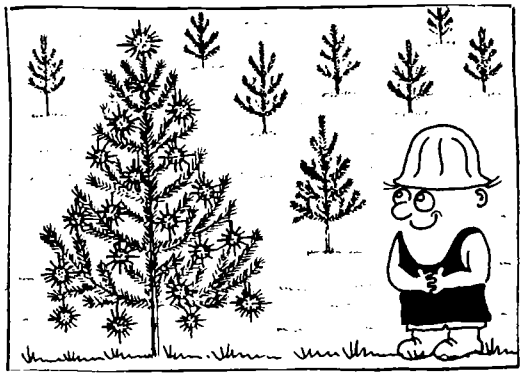
FILMS and pictures in encyclopedias showing primitive men living in caves are wrong, according to Dr Desmond Morris, the animal behaviourist. Only the most fortunate of early man found a cave for his home, the rest made "nests".

Morris said: "We are quite unlike monkeys or apes, who make simple leafy beds in trees and never use them twice, and more like birds in our home-making.

Allowing for the difficulty of proposing any conclusions from a non scientific approach to the psychological method of observation, it cannot be ignored that plants have been around for about 300 million years. They were known to human beings long before there were any recordings made of their history. Archeological evidence has shown that Neanderthal man used flowers in rituals. Pollen in abundance from various herbaceous plants was found alongside some of their buried dead.

If one believes in the theory of evolution then trees were once our home and as a habitat presented to us an environment that resulted in certain physical adaptations. The changes were slow to take effect but were accompanied by changes of the mind both of which are in fact inseparable as part of the whole human organism. It has been suggested that responses from these early evolutionary days are still embedded in the human person today, as indeed less remote landscapes are cherished in the memory though the image becomes fainter and harder to recall with each passing generation removed from direct contact of the proto-landscape.

Plants have featured throughout the development of the world. Plants are well documented in all civilisations though Emphasis is on varying aspects of plants, possibly due to differing climatic, geographic and social conditions. These affect type of plants and growth of vegetation and dominance of specific sorts of plants. Universally, however, plants have become a strong symbol and symbolic feature (highlighting their broader fundamental importance to people) evident in all communicative forms of language. This very much keeps alive the various landscapes in peoples memories.



"Symbols are a development of acute space experiences having charisma preoccupying people over an extended period of time, a guide presenting important unconscious material seeking integration and expression with our consciousness" (Jung: in Lyn. G A Psychology of Building.) Further it may be said in a man-made world much that is communicated is explicitly stated, expressed as signs, where signs may be considered of univocal nature with a one to one

The Image of the Tree as a symbol of human life is still powerfully present for modern man, although rarely accepted by the conscious intellect.

Peter Hooper pp 18

correspondence. Compared to that of natural elements the plant as a symbol is multivocal in nature with a many to one correspondence, whereby messages are implicit.

Major communicative techniques that show a history of plant symbolism are:

A. ART AND DESIGN

SOUTHWELL MINSTER
HUNTER, J. (1985)

Where plants are used directly or indirectly in applied decoration on day to day commonly used objects. The artist in each case is obviously inspired by the familiar local plants. This is seen in the highly decorative ancient persian bowls and carpets through to the building facades of the thirteenth century to leaves and flowers of Gothic carving. This shows that incorporation of more natural elements, especially plant life to soften the man-made environment, has a long history. Intricately carved watch covers with vines and leaves of the arts and crafts era, and the floral patterns on wall papers and cloth of the industrial age, are further attempts by people to move back to the nest. Furniture either made from plant material or shaped or decorated with plant symbols is yet another method of bringing nature indoors.

SOUTHWELL MINSTER
HUNTER, J (1985)

The actual plant depiction varies from place to place as does the vegetation, the people and the way of life. Most people surrounding themselves in a symbolic way with local, known, flowers and trees.

The bright cloth large flowers indicative of the hibiscus of the tropical regions are favoured by many polynesians.

On a more formal national scale, the Canadians stand under a flag whose emblem depicts a maple leaf. Wales boasts the leek as its national symbol and New Zealand in some of its sporting ventures wears a fern frond insignia.

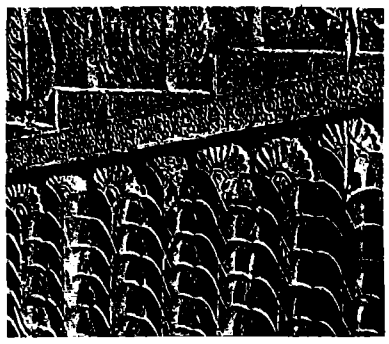
9.22 WILLIAM MORRIS
Apple wallpaper, 1877. Victoria and Albert Museum, London.

Paintings and engravings and sculpture, these have been subjects large enough in themselves to warrant specific study and volumes have been written concerning depiction of nature especially vegetation and the changes in emphasis thereof throughout the ages and the differing emphasis according to the artists culture.

B. LITERATURE AND WRITINGS:

From early mythologies the tree has always

been a powerful symbol. In the bible under Genesis in the old testament there is mention of two trees of significance. 1. The tree of knowledge and 2. the tree of life both appear in the garden of Eden in which man and woman were set as stewards.



Ancient carvings, witnesses of early woodlands in Iran/Antike Reliefs, steinerne Zeugen einstiger Wälder im Iran
KOPPS, H. TREE AND MAN IN ANCIENT PERSIA, in: IFLA YEARBOOK '86/87. pp 25

A single tree is never lonely, fusing as it does into a unity elements of earth and air and sky.

Peter Hooper pp 20

In ancient Persia forest and trees were of great importance. Trees were regarded as angels and only a good man could look forward, after his death, to being transformed into a tree and thereby attain eternal life.

Large trees were particularly venerated and it was believed that whoever uprooted a fruit tree would lose a member of their family that same year.

In the sacred book of Zarathustra are found hints as to protection of trees. Xerxes (486-465 B.C. created the first nature reserve protecting a stand of cypresses and ordering a royal guard to look after it.

In the busy centre of Roman life the Forum, the sacred fig tree of Romulus was worshipped.

The world tree representing ascent to heaven seems to have been quite a universal idea. A great tree at the centre of the world connecting heaven and earth, or heaven and hell.

For the Norse it is the Yggdrasil an Ash Tree. In the Scandinavian Eddas, the ash has; its roots in the underworld of the dead, its trunk in the middle Earth of mortal man, its crown in the heavenly world. In India in the Mansara the 'Wishing Tree' is spoken of.

Early sacred trees of the Minoan Crete and the Byzantine Empire encrusted with jewels have been made legend, while in other cultures certain tree species were held as sacred. The Celts and their Oaks, for the Germans it was Limes.

Some of the earliest recorded human sancturies were in fact groves of trees. In anciant Greece copses of trees were given deity and were thus sacred areas in which only certain conduct was tolerable. Usually these areas were for contemplation. Similarly the celts with the Nemi.

The association of trees with contemplation and meditation has also been recorded with

1. Newton the apple and gravity

2. Buddah the Bo tree and nirvana.

So that today we find many gardens designed especially for contemplation.

The Maori in Aotearoa, New Zealand have a mythology and geneology that shows a close relationship and identity of trees and the people.

Thus it can be seen through these writings and stories early perception of trees indicating their importance as afforders of

1. Raw materials and resources
and
2. Sacred and spiritual value.

This illustrates the permeation of plants into all facets of life of all peoples.

More recently in todays urban lifestyle especially that of the more aggresive western European heritage there is not so much reliance on trees for the day to day supply of raw materials for fires and such. Technology has provided us with different forms of resources to fulfill the part that trees once played. There is coal and oil for fuel and electricity to run the many time saving devices that fill peoples lives and living space. And so too, the traditional forest legends and fairytales that were once popular in childhood years are losing significance and meaning as we move further from what was once our home, the forest, to the newly created jungle of urbanisation.

The story books of yesterday, Hansel and Gretal, Snowhite, Robin Hood are giving way to science fiction novels and comics full of super heros and Mickey Mouse.

New Zealand

In New Zealand, however, there is an abundance of writings about the natural landscape, and the ubiquitous New Zealand "bush", and not just the more recent photographic glossies for the sight-seeing tourist.

POHUTUKAWA CLAUS EDWARD FRISTROM

Due to New Zealand's variable geography, geomorphology and the conducive climatic conditions and somewhat relatively meagre size of population most New Zealanders come in contact with areas dominant in vegetative cover every day. This pervasive force cannot but help to lead to plants being well

represented in New Zealand literature, advertising, film and painting.

The early Western European 18th century invention of the landscape as a cultural, psychological and aesthetic phenomenom and the fundamental pervasive Maori forest lore and strong spiritual attachment and the eminent presence of the vegetation captivated many writers. From such a background not only was the vegetation an important influence on writings but the writers attitudes, expectations and emotional and and psychological needs of such natural surrounds. Early pakeha literature painted a formidable picture of the New Zealand landscape. The forest cover was depicted as most dauntingly oppressive.

"It is all merely gloomy forest
A wild and weary waste"

Shephard, Paul. English Reaction to the New Zealand Landscape before 1850, in: Cooper, Rhonda. Wordsworth does the Heaphy Track, in: The Landscape, Spring 1987.

I fell in love with that dark-foliaged bush which had for me an air of pain and melancholy, a spiritual grandeur which no one can ignore and which causes the population there to develop their lives in rebellious contrast.

Janet Frame (1979) "Living in Manitoto" Countless Signs

Its awesomeness grew with the adoption of the sublime, thus alienating the person from the landscape. Novels extolling heroic venture through the vast tracts of rugged forested wilderness were built on and enhanced this ideal. Such ordeals usually of supernatural or spiritual forces were either purifying or tragic in effect. Isolation in the european sense was the most pervasive issue, which is not similarly known to the Maori for whom the forest is ancestral and therefore of kin. For the Maori there was not the same physical apprehension. Rather the apprehension was due to the possible transgression on the good nature of the great ancestor of trees and people, Tane, and of other individual local atua's or guardians. Thus the Maori unlike the pakeha could never be alone in the land.

Another more positive streak in New Zealand literature where it seems people had at last come to terms with the foreboding forest required a change of landscape from the ever looming physical threat to something that was not only physically more manageable but which was perceived as being more manageable. Consequently there has been a glut of writing dwelling on the battles of taming vast tracts of entangled, impenetrable bush to passivity. From axe to plough. The stress on fertility and prettiness. A new harmony wrought from the clutches of the native vegetation,

creating in its wake green pastures of park-like appearance.

More recently the emphasis has been on the perceived tranquility associated with the tamed countryside as opposed to the growing feeling of hostility towards the noisy, violent, rushed, polluted cities. Thus recognition of our dependence on our aesthetic and psychological inheritance is always present in New Zealand society.

Our understanding of the ways in which we really do relate as a people to our environment is crucial to our self-understanding.

C TRADITIONS AND LAW

As in other countries New Zealand has annually a day in which recognition is given to the importance of vegetation 'Arbour Day'. Arbour Day in fact is known to have been celebrated as early as the 5th century A.D. In Persia it is marked by a national holiday.

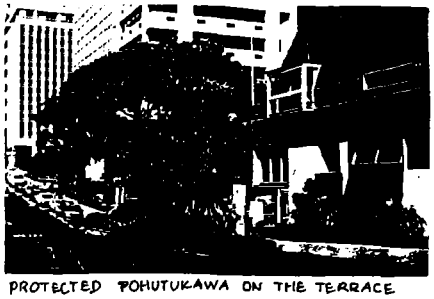
In New Zealand the event is usually celebrated by the planting of trees an undertaking by many schools throughout the country. 1984 was the announcement of the Year of the Urban Tree.

Peoples reaction to nature is an example of a non economic need

Kaplan & Kaplan (1978)

These indicate a strong public concern for establishment or maintenance of trees for the betterment of the land and the people. This would seem to indicate preference for vegetation that is not centered on materialistic attributes but rather those that are pleasing to the psyche.

The above is also reflected in the Royal New Zealand Institute of Horticulture scheme for protecting notable and historic trees. This scheme has been in existence for a number of years and has more recently been involved with a programme to evaluate trees within a standarised reference system. Introduction of some rigour is important in seeking political backing when proposing sanctions on areas of existing vegetation. The current Town and Country Planning Act as interpreted by a few district schemes makes provision for "the preservation and conservation of trees, bush, plants or landscape of scientific, wildlife or historical interest or visual appeal". In some cases development must not disturb existing vegetation in other cases development must undertake planting to ameliorate or restore altered landscapes.



PROTECTED POHUTUKAWA ON THE TERRACE WELLINGTON.
FLOOK, R. (1985)

If enforcement of such laws were to be strict the words need to be given more authorative weight and definition. However, that such legislation exists does suggest a generally universal appreciation of vegetation by New Zealanders. A study by a psychologist Richard Kammen would seem to confirm this. A questionnaire broadly measuring the wider New Zealand public ideas on well-being showed a positive result for the natural environment and the ranking attained was higher than that attained by their American counterparts for whom the survey was also run. This shows that New Zealanders by and large feel good about their natural environment. From prior discussion it may be noted that value is assigned to vegetation as a part of this naturalness.

D. CUSTOMS

Customs adopt plants and give them meaning and plants themselves give meaning to customs. Emotions and virtues haves been typified by flowers, rose - love, lily - purity indeed there has been quite an extensive language of meaning associated with specific flowers. The giving of flowers remains as a useage in many cultures and the symbolism in the gift is appreciated not only by the receiver by promotes envy at times by onlookers. So are emotive responses shown with regard to flowers.

CHAPTER SUMMARY

What is important in this discourse is that plants and vegetation are not recognised as neutral background but are brought into and, combined with every facet of human living: the pleasure aspect affecting human psychology, the symbolism inducing psychological response. The attribution of awe, of haven, of mystery reflect an evocation which is as profound as it is universal.

Particularly with plants and vegetation is the respect for their value as typifying nature, our relationship to it and the unity people have with it. This respect for their value extending to that dimension which is not mere experience but which is perceived and enters the mind and works upon it in ways not yet understood and as yet defying explanation.

In a non-scientific way there can be some regard to human expression of response to plants abstracted from their utilitarian

qualities. Under the testing method of observation we have given broad coverage of human experience. In some of this there could be said to be an element of introspection in that in writing and in action individuals and groups of people have told us much about the effects that plants have had on them.

As stated no scientific or reliable conclusion can be drawn from such an exposition but there is an undeniable effect shown in the many responses which is general and persuasive of the view that all cultures view plants as an important feature of their daily living environment. This is a living environment in which persons and plants are both present and directing and impressing attitudes that are woven into the cultural way of thinking, appreciation and expectation.

CHAPTER 3

CULTURAL APPRECIATION OF PLANTS

In discussing psychological effects, there is an immediate problem in that in each of us there is a conditioning which will effect our response to vegetation. Notable is the culture of which we are a part and in which we have been nutured.

In this chapter the traditional Maori and Pakeha attitudes towards vegetaion are used to illustrate cultural variations.

Does the ethnic or cultural background of a group play a part in psychological effect? If so in what way does it have significance in plant use?

CHAPTER 3 CULTURAL APPRECIATION OF PLANTS

In Aotearoa, New Zealand we can expect a different psychological response from one nurtured in the Maori way of life to that of the person reared in the values, ethics and appreciations of western European culture.

MAORI

In order to gain some understanding of the spiritual relationship of the Maori with land a look at creation as known to that people is essential.

In the beginning there existed Te Kore Kore which literally translated means the void but which can be variously described as the matrix or the active and passive state of the female and male principles. Both principles are necessary for any creation to begin. Te Kore Kore can also be seen as the spiritual essence of the supreme being, of Io-Ma tua kore (the parentless one) or Io-Take Take (the first recourse).

From Te Kore Kore advance the twelve night districts. Moving from Te Po Nui (the great night) conveying the sense of the dense night through to the Te Aumarama (the broad daylight). The light of day, the first state of reality in Maori thinking is similarly divided into 12 planes. The movement between these realms being cyclical and regenerative.

Into this pattern are woven Rangi-nui and Papatuanuki the great sky father and the earth mother, the first parents. These two forming the matrix of all that is within the universe. Of these primal parents are born offspring the number of whom varies. Some tribes claim 70 offspring though seven are considered common throughout most tribes. They are

Tane - God of the land and all its inhabitants

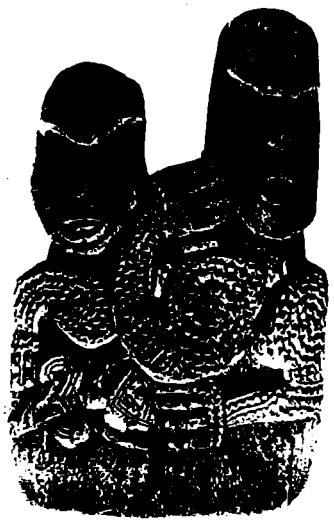
Tuamataurenga - God of War

Tangaroa - God of the sea and waters and all their inhabitants

Tawhirimatea - God of wind/bad weather

Rongomatane - God of cultivated food

Huamiatiketike - God of uncultivated food



Men and women re-enacted the roles of the primal parents. Two ancestors, a husband and wife, from the facade of a chief's storehouse.

ORBELL, M. THE NATURAL WORLD OF THE MAORI. PP 67

Ruaumoko - unborn the God of earthquakes and volcanoes

Rangi-nui and Papatuanuku were clasping each other so tightly that the brothers were born into endless darkness, of which they grew tired. Tane is the brother responsible for pushing them apart. At the time of separation which Rangi-nui, became Rangi-e-tu-nei (the great heavens). Upon separation the brothers world was filled with light, and they began to fill and shape and beautify their parents. Tane carried on with the task of Rangi-nui in creating the heavens. Tane was also the progenitor of all manner of living things and clothed Papatuanuku in the trees and birds of the forest. Tane was known under several different names.

To make more fair the body of Papa his mother Tane planted trees, clothing her in the dappled gold of sunlight and blue shadows. At first he stood these trees upon their branches, upside-down, their trunks as the torsos of men, their shaggy roots heads of hair, since he saw them as living beings like himself. But when he remembered that it had been only by lying on his back that he had been able to wrench earth and sky apart, he reversed the postion of the trees, planted their heads of root in earth, that with the upthrust power of their limbs they might continue to uphold the sky.

Peter Hooper pp 14

Tane Mahuta - the God of Forest

Tane-nui-a-rangi - symbolising the tree of knowledge

parallels the Hebrew tree of knowledge in the garden of Eden, and here Tane is acknowledged for his prowess in aquiring knowledge of all things pertaining to the well-being of human kind. The symbolic tree a link between Rangi-e-tu-nei and Papatuanuku, heaven and earth thus has strong spiritual meaning in which Tane responsible for their separation and for bringing to the people the three kits of knowledge from Io-Ma-tua-kore is known as the cosmic tree.

Tane was also the creator of the first human mortal, however, because he himself was the offspring of the first primal parents he could not give life to the form he'd created. He could not dominate over Rangi or Papa or indeed creation.

Thus in fashioning this mortal Tane returned to the soil of sacred Haiwiki Korawhai Te Kura, (some tribal variation). In order for the form to have U-he, the female principle, Tane returned to Io-Ma-tua kore and through Rehua, Io-Ma-tua kore's attendant received the gift of life, which he breathed into the nostrils of Hine ahu one - heaped up soil maiden or Hine hau one - breathed on soil maiden.

Hine ahu one and Tane married and had a daughter - Hine titama - the dawn maiden or Hine-tauira - maiden patterned after her mother and so from Tane human beings derived

their life origins.

Thus Tane is depicted as the procreator giving meaning and giving geneological links of humans to all natural created elements. Tane was the one who had access to the supreme being, and it was he who was given instruction as to how life was to be ordered in this the natural experience world.

So people and trees are connected geneologically. They are also connected through the physical life principle that is imbued in every natural object and human. In the human this is called the mauri-ora which differs from that of the rest of creation in that the physical life force is derived from Io-Ma tua Kore via Tane. All other creation was created by the offspring of Rangi and Papa and thus possess mauri, the life principle that derives origins from Te Kore Kore, the spiritual life principle or ethos of the supreme being. So although humans and all other creation, in particular trees, are connected through Tane geneologically and through the life principle humans differ. Humans are given mana - spirit, power and authority derived from the supreme being to act in accordance with the offspring of Rangi and Papa.

If we do not honour our origins, how can there be respect between those who now are, and those who were, and those who are to come? So it is with Tane and his works. This tree is the child of Tane, as we all are, and we must recognise and respect this parenthood.

"The Tree" in Countless Signs pp 219

For the Maori trees are seen as kin, therefore, in using such offspring as a resource, rituals of perpetuation, appeasement and acknowledgement of the God Tane were performed. The first fruits were offered back to the deity. Any act had thus to be sanctioned and this ensured no abuse of the natural elements. These rituals manipulated forces of nature but also celebrated the unity of kinship and continuity of such a relationship.

In using natural elements it was understood that there was a natural ordering and that these were separated into realms each having a guardian to preserve the life force. And so the notion of tapu existed and was law, having divine origins and manifest in the secular control thus controlling human use and activity towards creation and trees. Tapu, put resources into the presence of the God, the protector of the species. This required a person to seek permission of the God or guardian to use the resource.

Fashioning of Tane into spears and such like by Tuamataurenga provided an example for the people who also began manipulating the life

A PAINTING ON A RAFTER OF Te Whai a te Motu. pp 21 ORBELL, M. THE NATURAL WORLD OF THE MAORI (1985)

forces of the created elements. This enabled the snaring of birds, the turning of soil in the gardens, the building of canoes for travelling. In all, the carver had to be an expert in both the spiritual arts and the creative arts. For in any carving the spiritual cloak surrounding the spriritual source, the mauri of the wood had to be penetrated in order to be manipulated by carving. The mauri itself taken on by the carver and in carving the mauri itself changed taking on new shape and new meaning. The mauri of the tree being fashioned inspired the person carving.

Such changing by manipulation of natural elements was accompanied by rituals of perpetuation. These had important implications with regard to Papatuanuku and the different approaches between the Maori and the Pakeha way of utilising 'mother earth' and the forests.

The traditional Maori spoke of two main food baskets, the forest and the sea. The forest was accordingly prized and its use was restricted. The aim was conservation. Before any form of manipulation rituals were enacted.

However with the arrival of the European came vast changes. The clearance of trees and ploughing of the land, changed Papatuanuku, the life-force and so changed the meaning the essence of the land beyond recognition. All this was watched by the Maori. No apparent rituals were performed. What was of significant effect over and above the physical changes was that the pakeha also bought with them their own religion, christianity, and they were not affected by tapu, all of which gave rise to a belief amongst the Maori that the pakeha God was too powerful to resist.

In Maori tribal law one tribe had to dominate the others atua before there could be any taking over and so the Maori tried to incorporate the pakeha system into their own tribal beliefs. Thus they accepted and sowed Christianity into Mother Earth to relate it to natural development. However the symbolism of created elements, the personifaction of the Atuas and the arising of the land wars all meant there were no benefits in christianity. The conflict chased the Atuas away and so the Maori turned back to their own beliefs but took back symbols from the bible especially that of liberation and Yahweh freeing oppressed people. And so there arose the

view that the pakeha were raping Mother Earth and the whenua, the after birth, was being ripped, torn and changed on a vast scale and with no ritual of attrition, which could be likened to giving someone a face lift with no anaesthetic. This change wrought by the pakeha could not by the Maori be requited and made good so the Maori were affected spiritually, physically and psychologically. Thus did the European present a direct challenge.

This is not to say that no change is acceptable. Indeed the Maori like the European were a migrant people. They came from a tropical climate bringing with them plants and wildlife. Upon arrival they found they had to adapt to Aotearoa's somewhat cooler climate and differing conditions. It was believed that all things had to be given to Mother Earth to feed and nourish. All created elements that were adopted and given sustenance were then accepted and named. However, it was recognised that the natural process was changed and as such the natural creation took on new meaning. The guardians themselves changed in spiritual essence and new guardians were situated. And so it was that the Maori had to learn about their new environment, cosmocise and make sacred the natural elements and give meaning to the existence of created elements. In learning by observation they became a people taught by the environment. The envionment thus, determined their social, religious and economic fabric.

What is man but a tree turned upside-down.....

Richard Rolle

The Prickle of Conscience in Peter Hooper pp 14.

Among the highly valued natural elements is the Totara. It has a special mythical origin and is considered as the principle member of the lordly trees. The totara is a tree with which the Maori had a unique relationship because in most parts it was useful. It was a wood prized for its resilience and strength, attributes pertaining to manhood. Thus the Totara was thought of as depicting Tane, Tane literally meaning "male".

Personified as the ancestor Tane the Totara is evoked in many rituals. It is not just the trees in themselves that are the presence in such an evocation but the understanding of the relationship with Tane, and so are they preserved in Maori oratory.

An important chief was often alluded to as a rata whakatau or rata whakamarumaru - the shade giving or sheltering rata that is the protector of the people. And E kore te

totara e tu noa ki te parae, engari me tu ki roto i te wao. A totara tree is not found growing out in the open country, but in the heart of the forest. This implies that the chiefs proper place is in the midst of his people where he will retain and uphold the mana of the tribe, even to its outer bounds. The forest as a whole is often alluded to as wao tapu hui a Tane - very tapu forest of Tane.

Pare stood up 'E hika e'! Let us think for a moment of what this tree means in our lives. She is the only survivor of an earlier time. Of all our great ancestors she is the only one who still lives, who still has her being among us. Who saw our fathers too, and our grandfathers ....

We must love her in her own way, this tree.

"The Tree" in Countless Signs pp 220

And so we see that for many Maori a tree is a tree but a tree is also Tane and Tane is a person, a deity, offspring of Rangi and Papa, the God of all manner of living things.

PAKEHA

The pakeha, due to a different spiritual, historical, economic background have a different set of values, a different appreciation and relationship with the land and trees. Their tie to New Zealand has been altogether brief about 180 years or approximately 8 generations. Figuratively speaking this suggests a connection with a fine piece of string as compared with the thick net of ropes that the Maori wove over 1500 years and many generations.

The depth of knowledge and understanding of the Pakeha for Aotearoa, New Zealand, who came from the northern hemisphere with a different though temperate climate and land of different geological origin must have been somewhat shallow compared with that of the Maori of that day. Like the Maori they arrived bringing with them some of their familiar and endeared natural elements. Coming from a christian theological ethic they brought with them a belief in the importance of self and the soul and the domination of human kind over the rest of creation.

Thus did they seek adaptation by changing the natural environment to that more accessible and more familiar to themselves and their origins. For the early pioneers of the 1800's Aotearoa would have confronted them as a land of mountains and vegetation. The forest was so vast as to cover all the land, so dense and tall as to prove foreboding. The forest was full of the unfamiliar, the dangerous where even the undergrowth was impassable.

The forest and land are so clearly the parents, the ancestors making their presence known, and what else may people do but rebel against a life of such dependence?

Janet Frame (1979) "Living in Manitoto" in Countless Signs

The New Zealand 'bush' as it came to be known

CUMBERLAND, K. THIS IS NEW ZEALAND: A PICTORIAL DESCRIPTION. (1956) "BUSH BURN"

was something to conquer, subdue and win a piece of land from. Clearing enough for a house and garden first, 'fencing out' the bush, then further clearance for the familiar pastures. The native vegetation was relegated to the background. The more familiar poplars, willows, macrocarpas and oaks etc, were introduced and created the agrarian landscape of tall trees awash in grass. Pastoralism was not only a familiar land use visually but was strongly advocated in pursuit of economic gain involving an active management regime that had been passed down from generation to generation back home.

It was from within their safely bounded zones that recognition of particular plant species and appreciation for such arose. Identification through aesthetic purposes was gained through visual contact with the peripheral zones on the boundaries of settled properties. These zones were important for their accessibility and led to furthering of familiarity with the indigenous surroundings.

Today we see the results of a change in perception of the New Zealand bush. The fear and mistrust is much diminished, but not altogether gone. The 'bush' has in most parts been forced to fulfill certain human requirements. The fear was lost in perceived control and possibly in the fact that such pockets of bush that remained were somewhat modified and made visitable. Their profile changed from formidable to friendly.

Extensive grazing pastures were modified on a commercial basis to intensive horticultural orchard systems. The race is to produce bigger, better and more, replacing natural vegetation with marketable exotics. The landscape was changed to suit the new technologies. Large scale regular shaped lots to enable machine planting, pruning, and harvest, imposed a new pattern of growth and decay. Application of fertiliser, herbicides, irrigation, and pesticides controlled growing conditions in order to achieve the defined and desired outcome, viz. the supply to a range of consumer tastes.

The owner-occupier of a piece of land has available to him or her a wide variety of plants for productive technical and aesthetic purposes. The selection and arrangement of these conveys a character individual to the site albeit from behind fences and hedges.

Parks which once boasted the best of

pastoralist taste were identified by macrocarpas and paddocks; sea coast by marram grass; the rivers by willows and pasture grass. Avenues by planes and poplars. The Square by elms, oaks, horse chestnuts and grass. Over recent years they have, however, undergone dramatic change to include some of the more hardy native plants ake ake, cabbage trees, kowhai, pittosporums, pohutukawa, rata, taupata and toi toi.

National parks, the remnants of New Zealand native flora and fauna are also subject to categorisation for best use. Areas are set aside for recreation, scenic resource or scientific purposes. They are subjected to mapping, track cutting, hut establishment: all in the aid of providing for the user a safe comfortable semi-detatched wilderness experience. Specialist equipment ensuring all needs are catered for remove the onus of relying on knowledge or understanding of the bush. Even today there are few who truly go out to experience the bush for long periods of time.

Thus it can be seen that the pakeha approach to vegetation is influenced by the need for orderliness and controlled management, where the value accorded to plants must be explicable and categories designated into which vegetation falls. Vegetation is viewed as a resource for productive purposes, technical purposes and aesthetic purposes.

Expectations of these resources are in themselves limited and modify human behaviour. This strong sense of control and the more managerialist approach of the Pakeha is evident throughout their brief history in New Zealand in the shaping of much of the built up areas and communication networks that have been set upon the land. Land, vegetation and wildlife is seen as a resource to better both the physical and psychological condition of people. If it prohibits certain desired activities it is simply got rid of.

Much of this Western European idealism has been concerned with and still is today a prospective mentality ruled by gains, usually economic gain, though scenic beauty too suffers a 'what's in it for me' attitude. These two ideals compete and contest in the Pakeha world where we see presently the Greenie versus Greedy or Conservationist versus Developer issues persued hotly. And this attitude will remain as long as notions of qualification, quantification, and

accountability remains.

Landscape form generally is a vernacular product of the functional decisions of countless people. Individuals acting under circumstancial duress guided by traditions are quite different from works involving a large group of people and an overall design.

The differences in beliefs, values and meaning associated with vegetation by these two prominent cultures in Aotearoa, New Zealand, have resulted in tension and conflict over land use, expression and identity.

The more animist Maori attitude is strongly spiritually based with an acute sense of belonging and kinship between people and plants, people and their ancestors, where the people and plants share common geneology. Plants being of an elder branch of Tane over people a younger branch command respect. Spirituality thus ensures the Maori is never alone in the landscape. Spirituality also governs the use or manipulation by the people of natural resources.

The Pakeha with a more humanist approach unlike the Maori dominates and controls natural resouces. The latter serves to satisfy the needs of people. With a determinative attitude based on scientific explantion and the power of technology the Pakeha are a people detatched from the environment and are therefore alone on the land. There is not the kinship between the natural environment and the people. Any enforcement as to control of peoples actions with regard to the natural environment comes about through the legal system.

CHAPTER SUMMARY

Any person's perception is influenced by the culture he or she is part of, where cultural differences are strong so are the perceptions. The cultural differences between the traditional Maori and the Pakeha are basic and have led to much misunderstanding. There has been a lessening of ignorance of each others values in more recent times but active recognition and due regard for each others heritage and ways of understanding, attitudes and beliefs is far from close. Needless misgivings abound.

The time may well be ripe for an accommodation between the two for recognition that is active in reconciliation between the people and the

natural environment. Several factors encourage the view. The European has developed such of the land that seems possible. Indeed there is recognition that they have in some areas over done it and caused damage, costly to the land and costly to themselves. The primal forest has retreated to a distance that is 'safe' and no longer threatening. The original vegetation now has a romantic air about it and the introduced used is as it is expected to be. Affluence has afforded the luxury of greater leisure and what New Zealand has to offer is the 'outdoors'.

The country has been opened up to tourists who through the absence of original nature in their own countries come to enjoy it here.

Enough time has passed for the present generation to accept that New Zealand is home and many have come to respect, love and have pride in their land. The mind of many European New Zealanders has opened to the beauty and use of the land and its native vegetation. In this they are maturing to be interested in the development of the attitude of the Maori who had already come to terms with and adopted the land and its vegetation.

The land and forest as the Maori knew it in pre European days has changed irrevocably. Maybe if there had been no European migration but merely a continuing pressure from a vastly increasing Maori population changes would also have occurred and altered land useage and even land tenure. The Maori has, however, adapted yet retained their identity with the values of the land and vegetation. Those who have moved to the city return to their ancestral roots and are revitalized. Those who continue in their own lands retain and impart the heritage that remains relevant and practicable to the times. In this adaptation a sharing between a maturer European and the Maori would be of benefit.

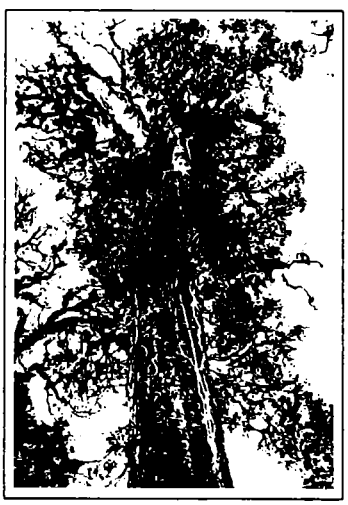
CABBAGE TREE

A jointly shared respect that is made physically manifest in the landscape returning those elements of value and those of reference is a goal to be sought. Restoration of Mother Earth allowing for the fullest expression of nature and of all cultures sharing such nature is not an idle notion anymore. Superimposed upon the cultural effects is the notion of familiarity whereby one can expect a response more favourable to a visuality of something which is familiar and has already been comprehended, assimilated and

found agreeable. Both Maori and European introduced plants to New Zealand for food and in the case of the European trees and bushes to create a perceived idea of home. Home is progressively inclusive of New Zealands own nature to the European who is not anymore a settler but becoming indigenous. Awareness has grown from writings to conservation action to legislative interest and enactment.

The dichotomy of materialistic interest on the part of the European and spiritual identity and interest on the part of the Maori is less pronounced as the European finds non materialistic values in nature and the Maori is forced to come to terms with irreversible change. Talk needs to convert into action and the landscape architect has a considerable role.

Of greatest moment is the fact that there is on the part of many concerned individuals a need for understanding of each others values beliefs and attitudes to nature and vegetation. This very concern is a powerful underlining of the psychological effect of plants, vegetation, greenness or nature on people.

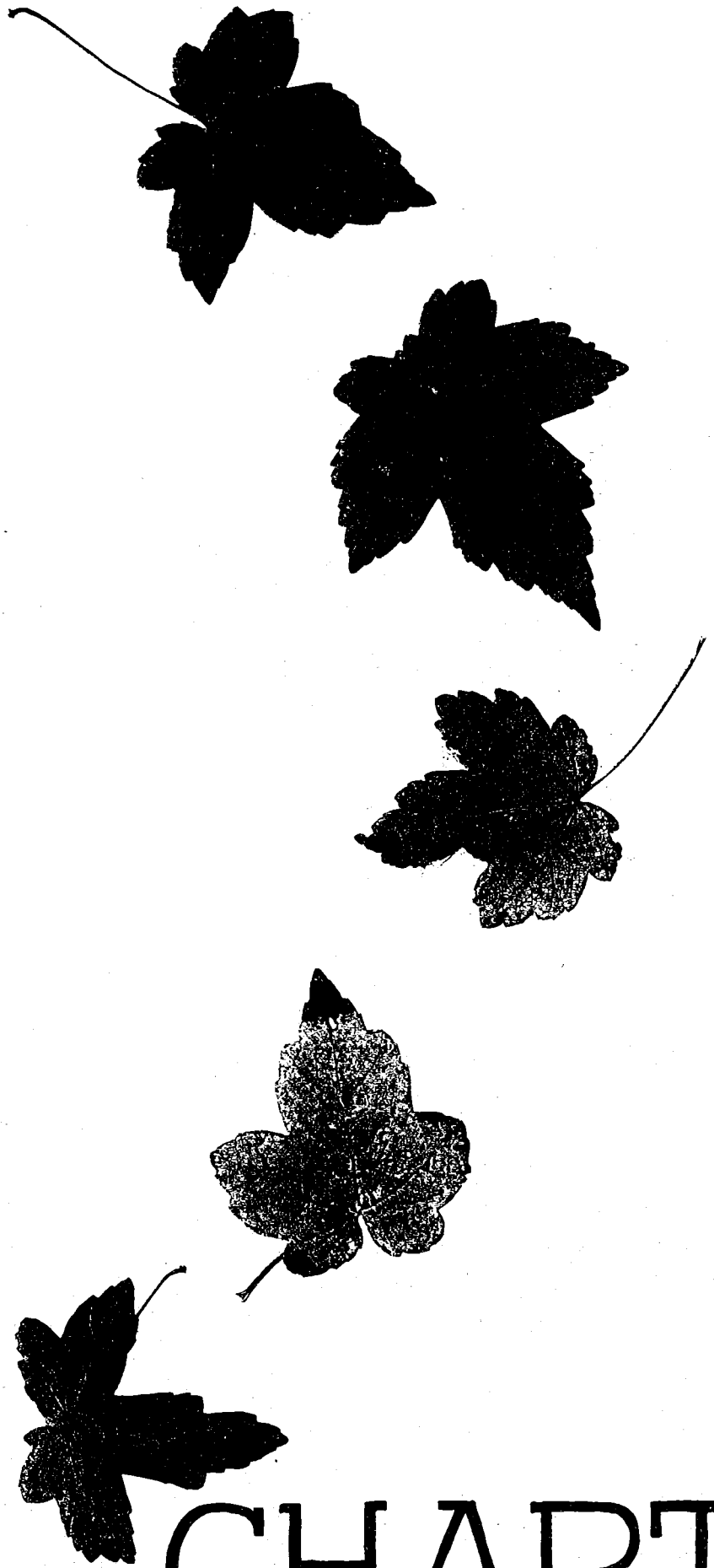


'We must talk again with trees, . . . Old kahikatea and epiphytes near mouth of Waiho River, Westland. Photo: *Derek Shaw.*

One must not, however, be too carried away. For many a European and Maori cacooned in a city insulated by a culture of manufacture the substance of this chapter as applied to them would be diluted. The relective thinking people are, however, the touch stone not those impoverished in spirit. Again the landscape architect by deft use of their craft can restore richness and understanding.

There are other personal and idiosyncratic features that affect the psychology from person to person within cultures that can affect the result of any testing and generalisations that the investigation might wish to posit as reliable guides or rules.

The testor cannot be deterred by these variables but must take them into account in their endeavour to formulate valid paths for the practitioner to follow.



CHAPTER 4

SOCIAL RESPONSE TO PLANTS

Looking again at group response to vegetation this chapter highlights a social response to vegetation in urban areas. Using observation of behavioural response to areas devoid of plants or to areas in which plants were introduced, postulations have been made.

Does the old nostrum that exposure to nature can calm anxiety and help people cope with lifes stresses hold any weight?

CHAPTER 4

SOCIAL RESPONSE TO PLANTS

All fields we'll turn to Sports grounds,
lit at night
From concrete standards with
fluorescent light:
And over all the land, instead of trees,
Clean poles and wires will whisper in the
Breeze.

John Betjeman "The Town Clerk's Views"

Observation as a psychological testing method is more suited to the area of animal psychology. Its use is increased upon introduction of variables to see whether differing behaviour will result following manipulation. This technique is often associated with, reward - punishment elements and work done with identical twins.

Because of the almost universal presence of plants the producing of any theoretical background of psychological response to plants would be difficult using observation only.

MAN AND NATURE IN THE CITY. SYMPOSIUM

There has, however, been consideration of people and groups of peolpe in environments so urbanised that exposure to plants and vegetation have been denied respondents. As an educational measure, ghetto children in some cities in the United States who were seen to have been subject to this total denial were introduced to areas where the natural ecosystem operated.

Unfortunately no check or measurement was taken to see whether there had been any psychological starvation that required redress. This educational approach was supplemented by the reintroduction of vegetation and planting into the ghetto areas. Subjects were also given plants to care for with instruction as to the care and nurture required.

LEWIS, C. (1979)

In other areas in ghetto renewal and tidying, local authorities made plantings relying on public participation for their care and maintenance. There was in some cases reports that those living in the ghettos responded to the programmes positively and not only participated but sought provision of further land and facilities and plants to reintroduce a more evident visual change. Proceeding from that interest, was a move from within the area generally, to upgrade and make more habitable an environment which had been in a serious state of degradation.

Not only did the environment improve but the attitudes of those in the neighbourhood became more aware of factual degradation, became more positive, more self reliant and more human, in adopting remedies. Associated with this was

The healing quality of urban gardens, urban vegetation, and plants in buildings and on window sills is real. In some they fulfill needs not met by the brick, steel and glass of our creation.

Lewis (July 1979) pp 337

a growing sense of pride, a reintroduction of relationships from an isolationism to community cohesion and to a community caring that spread to individual concern and to elimination of much vandalism and destructive impulse.

A paper by Seymour M Gold devoted to the topic of social benefits of trees in urban environments highlights their possible contribution to stress reduction in these largely man-made inert and timeless areas. This paper draws heavily on a well documented bibliography, research or proof background. Postulations are made which are important if they are true. He states the paper is based on the writers research in the Agricultural Experiment Station supported by the Department of Environmental Horticulture in California.

To the extent that we are merely identifying with our environment and not being independent of it with a separate identification confidently our own, then the ugliness and the surround will increase our own self-demeaning and militate against our self-exteem.

Man and Nature in the City
Symposium pp 75

His concern is that trees have potential social benefit in:

1. Providing sensory diversity
2. Reducing vandalism
3. Increasing property values
4. Conserving energy
5. Increasing the use levels and safety of of urban parks

Dismissing these benefits as "intangibles" by conventional analysis because of a lack of impirical evidence had been overturned by research indicating trees do have a significant impact on urban life.

He categorises vegetation as the

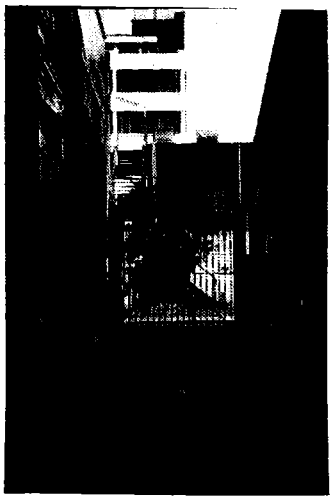
1. Interstitial forest of trees growing between man-made objects (e.g. heavily wooded areas between urban centres in older cities, tree lined avenues).

2. Parks and open spaces relatively free of man made objects (from small concrete squares almost devoid of vegetation to large natural parks dominated by vegetaion).

3. Gardens for ornamental plants and food (ranging from window boxes to roof tops, houseyards, planting strips, community gardens and commons).

4. Lawns or interstitial grasslands.

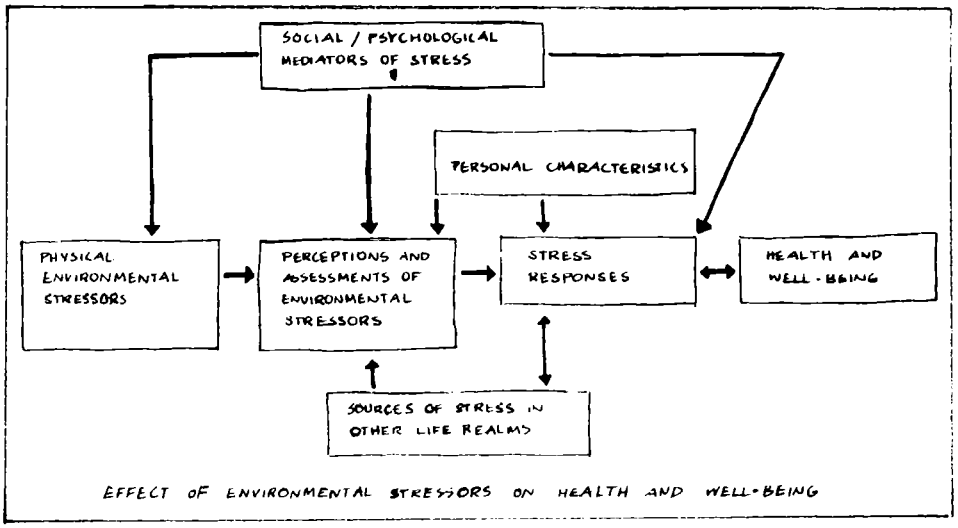
In all the tree is the most dominant natural



element providing a dimension of enclosure, human scale, seasonal change and history that other forms of vegetation can not easily duplicate.

His conclusions as to non use of urban parks, energy, conservation and leisure patterns and stabilisation of property values are important but are outside the context of this study.

He does alert to studies which show differences in vandalism levels of well landscaped as against non landscaped surfaces due to stressful urban environment arising from urban complexity, air pollution, noise, visual disorganisation and crowding.



EFFECT OF ENVIRONMENTAL STRESSORS ON HEALTH AND WELL-BEING

The landscape architect must enlist the assistance of science - biology and medical science - in order not to be put off as a mere idealist and a dreamer ... gardening becomes a medicine and garden architects are physicians rather than designers'

Peter Gliechman
The Social Aspects of Green Space in Planning Large Cities

In Mgt Techniques for Natural Areas: Ideas for the future
Allan R. Ruff

The quality of the designed landscape does not necessarily correlate with a reduction or solving of problems of social disorganisation that contribute to rising levels of vandalism. He does, however, postulate that the relationships do indicate a positive effect of trees for reducing the types of environmental stress generated by noise, visual disorganisation and crowding which are contributing causes to vandalism in public places.

Where he raises the potential of trees to stimulate the senses, sight, taste, touch and smell he suggests this has not been realised in cities. Although the literature has devoted much attention to cataloguing the virtues of various plants for colour, texture, fragrance, he accepts that relatively little

The maintenance problem here is an important one, whereas nature goes through a seasonal renewal and one has the reassurance at least that one is in touch with the natural ongoingness of constant renewal. The central city is essentially that part of the city which either we are desperately engaged in renewing, or we are not renewing at all,

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is known about the human response to these stimuli.

This is not so for visual response to environments which include or exclude trees which have been described in studies by Stephen and Racheal Kaplan and J.S. Went, J.B. Landsing, and R.W. Marrans and A. Lukashok and K Lynch. These studies are not included as others mentioned are more apposite. Their conclusions are that those places with more vegetation are more interesting than those with less vegetation.

CHAPTER SUMMARY

These studies apart from one conclusion propose areas requiring further inquiry in order to collate more substansive evidence on which action may be taken. One of those areas is that concerning possible neighbourhood groups in active involvement in a common interest of planting and plant care. Thus inviting a community response where time is spent outside and shared with those living close-by.

Further, use of vegetation alleviates proposed stresses of modern living, in which, urbanisation and the automobile have a profound effect on the senses. Areas of vegetation are used as a landmark providing a reference point of familiarity for cognitive mapping. Vegetation is used for micro climate creation (temperature control, windspeed, air particle content).

Plants are used to manipulate activity by directing movement and evoking response. Plants are used also to break up large open spaces dispelling the crowded noisy conditions by screening, masking or contrasting.

Many psychologists are aware of destructive social forces arising from the built environment which, while not all related to absence of natural elements, may well be partially influenced by lack of vegetation. Golds paper suggest some of the more restorative qualities trees may afford in stressful and in crowded conditions.

Without understanding how to ensure the health of nature we have no hope of ensuring the health of mankind.

Michael Cole (1975)

SECTION 2

CHAPTER 5

PASSIVE PEOPLE/ PLANT INTERACTION

Using the psychological testing method of introspection this chapter looks at more recent studies involving nature or natural elements particularly vegetation and peoples perception of it. There are results indicating preference for certain environmental aspects.

Most of the testing methods do not involve direct inter-action between people and plants but are based more on surveys and interviews to guage values and possible reasons for them. They provide a range of possible testing methods and cover a range of possible plant affordances.

CHAPTER 5 PASSIVE PEOPLE/PLANT INTERACTION

PSYCHOLOGICAL TESTING METHODS

INTROSPECTION

In various forms studies have had to rely on the various techniques psychologists adopt under this heading. Special status is given to the interview and questionnaires as a testing technique. For establishing any psychological effects that plants might have it is usual to combine these techniques as being facets of enquiry to the subject and the subjects response.

As explained previously the data received can be the subject of distortion but with sensible screening and discounting of elements which would distort, such data is widely and profitably used. This technique has been used progressively in various forms by researchers to test some of the propositions that are gleaned in non-scientific ways.

If embarking on a research or testing programme the researchers must first establish what the test is to achieve. If the testing is to be a survey then a relatively large group of respondents would be needed but more particularly in that group a representative range of individuals that would allow some justifiable result free from bias. As a pre-requisite whether it be a set of interviews or a questionnaire the thread or the questions and the material under consideration must be designed to create a response strickly relevant to the area of inquiry.

The following are some of the areas of inquiry which would be relevant and helpful in understanding the psychological effects of plants. They arise from assumption, observed behaviour patterns either direct or through historical records and other considerations, and include the following questions.....

1. Is there any psychological effect at all? Are plants or vegetation merely a background in the environment which is perceived as neutral so that its presence or absence is of little concern? (See chapter two.)

   If it is not neutral is it of considerable or lesser relevance? The

practitioner would be helped if they knew whether their intended co-operation of planting were under or over-rated by themselves.

2. Does the existing environment affect the perception of subjects that is, are the psychological effects of plants on a subject in one environment different from those in another?

3. Does the ethnic or cultural background of a group play a part in psychological effect? (See chapter three).

4. If so in what way and does it have significance in plant use?

5. If there is a psychological effect what is it? Is there any relevance in the claimed effects;

   a. sense of freedom of opportunity to do what the subject wants and to be by themselves.

   b. sense of health as an awareness that plants are alive grow and change and that having them about is healthy.

   c. sense or appreciation of beauty the appreciation of plants as they affect line, form, unity, variety.

6. Whether plants can be categorised and weighted according to stronger or lesser psychological effect.

7. Whether a significant aspect in psychological effect arises from the notion of care and dependence of the plant on the subject. (See chapter four.)

8. Whether plants can be analysed into components imparting on the different visual, olfactory senses in producing different psychological effect that would help in synthesising a presentation.
   (See chapter eight.)

9. Does the old nostrum that exposure to nature can calm anxiety and help people cope with lifes' stresses have validity?

While the above suggested data are reductionist and perhaps inimical to the holistic approach that all writers deem essential in considering the environment no

harm is done and indeed there is value in assessing components to guage the validity of the whole.

COLLATION OF SOME STUDIES RELEVANT TO THE TOPIC

1. GREEN EXPERIENCE

A general study, one not confined to plants but more widely encompassing the natural environment, is that of R. Kaplan "The Green Experience". Kaplan was concerned with the consideration of how powerfully the content of the natural environment commanded our attention.

She looked at the definition of nature and preferred the term greenness, even though the encounter with the natural environment especially the unspectacular everyday environment comes in a variety of colour and guises.

She took as obvious, that the natural environment matters to people and this included both the city dweller and the rural population. What was striking was the importance of having nature "nearby" when the primary relationship was one of appreciation, rather than use.

Her study was to see whether pictures of everyday natural and built environments were differentially liked as a function of a content of the pictures. The answer was an overwhelming yes.

Out of a set of 56 slides the ones that could be categorised as "nature" were vastly preferred by the 88 freshwomen participating in the study.

Slides depicting urban settings were rated significantly lower other than one showing a few trees against a backdrop of tall buildings in a downtown park. To her surprise various residential scenes were liked least of all.

35 participants were retested 3 years later and preferences were the same but even more definite.

Another study using the same slides for very short durations approximating the glimpses one gets of the passing scene, produced little difference in the ratings.

The conclusion was that nature content of itself is an important characteristic of preferred scenes. There was some identification of factors that enhanced preference: e.g. the quality she called Mystery in which aspects of the scene enticed a "feeling of wanting to know more, to change vantage point and enter deeper into the scene."

Further support for the demonstration of the powerful role of the nature content was said to be exemplified in a series of studies involving the Environmental Preference Questionnaire. This was an inventory technique including a series of descriptions of settings and situation with a scoring for several different sources of environmental preference.

A high score on the scale suggested that a person derived a great deal of satisfaction from the enjoyment of nature and sought natural settings whenever possible, including when harried or under pressure. Several hundred have particiapted representing a broad socio-economic spectrum.

Another study mentioned concerned a drain and residents perceptions of it and possible changes it might undergo. The response was an option for a "nature amenity" with the chief factor a sense of "orderliness".

It is not something to be exchanged for something else, but an intrinsic reaction. People value even rather common instances of nature.

Kaplan, Kaplan and Wendt (1972)
Kaplan, R (1978)

In all the studies mentioned and in ancedotal material collected two characteristics were consistantly present, that natural environments were distinctly unspectacular and were appreciated because they were there.

These studies lead Kaplan to refer to Zubes comment on treelessness of many suburban tracts and the phenomena of the concrete jungle of architectural monument in the interesting question of how much office space one would be willing trade for the view of a tree outside the window.

2. URBAN TREES

Another study venturing a little closer to our topic but which was, in fact, concerned with measuring the impact of urbanisation on scenic quality is that by Brush and Palmer. The catalyst for this article were the changes resulting from urbanisation.

The models provide impirical evidence of the importance of trees for maintaining high

scenic quality in such areas. Again a careful sample of photographs was the material vetted and evaluated by a group of 30 landscape architects and planners employed by universities, public agencies or private offices within the study area. The Q-sort procedure was used whereby each respondent sorted the photographs into seven groups of fixed size approximating a normal distribution. Scores were assigned for scenic quality and were averaged.

An incidental comment supported the use of photographs to study how people perceive scenic quality, in that there was an ability to control what the respondents were viewing.

From the study above the conclusion stated that "the presence of trees in town landscapes is the single most important landscape feature affecting scenic resource value, to the extent that trees and woodlands are retained during suburban land development, and to the extent that street trees are planted and open space is reserved so that the scenic quality of Town Landscape can remain high as high as it might have been before as farmland or wildland".

3. PLANTS VISUAL PERCEPTION & ANXIETY

Roger S. Ulrich picked up the topic of visual landscapes and psychological well-being in a paper of that name. He was intrigued by the well worn nostrum that exposure to nature is psychologically healthful. The hypothesis that contact with plants, water and other nature elements can calm anxiety and help people cope with lifes stresses is advanced by numerous writers through history. He quotes Fredrick Law Olmstead a renowned American Landscape Architect of a century before writing that urban dwellers find nature relaxing and that nature reproduced in urban settings brings tranquility and rest to the mind. The subjective arguments favouring city parks and urban-fringe wilderness areas are persistant and require to be tested.

Ulrich addressed two principle questions:-

1. What effects, if any, does visual perception of nature have on feelings of anxiety?

2. How do these effects compare with those produced by views of urban environments lacking nature elements?

He did not think it artificial to exclude perception through other senses because vision is the most important sense in terms of yielding information about outdoor environments.

Again the basic design of the experiment involved showing coloured slides of outdoor environments to two groups of mildly stressed subjects.

One group was shown 50 slides of unspectacular nature scenes dominated by green vegetation.

The other group viewed suburban scenes lacking in nature elements.

The affect states or feelings of the subjects defined primarily in terms of anxiety. Emotions were measured both immediately before and after the slide exposures.

Comparisons of the results for the two different times made possible inferences concerning the anxiety reducing affects of the nature and urban scenes. The principle hypothesis prior to the data collection was that the anxiety levels of both groups would decline during the slide viewings but that the group shown nature scenes would report significantly lower post slide levels than the group exposed to urban views.

The acceptance of slides and photographs as surrogates for real environmental views arrested on many prior studies. The theories of psychological arousal assigning major importance to visual properties of environments as factors affecting psychological activation were relied upon. Much care was exercised in slide selection.

The subjects were students following a testing one hour course examination prior to the experiment and were considered to be experiencing some anxiety and elevation of arousal. To enforce attention to the slides 12 questions of the Zuckerman Inventory of Personal Reactions were to be answered. This is a broad affect test that measures an individuals emotion and anxiety state at the particular time the test is taken.

Five factors on feelings are assessed:

1. fear arousal,

2. positive affect,

3. anger/agression,

4. attentiveness-coping,

5. sadness.

A five point scale requires the respondent to indicate the degree to which each item describes the way they feel "now".

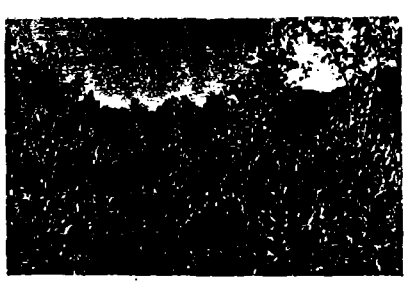
There was no statistically significant differences between the groups' scores for the ZIPERS test prior to the slides.

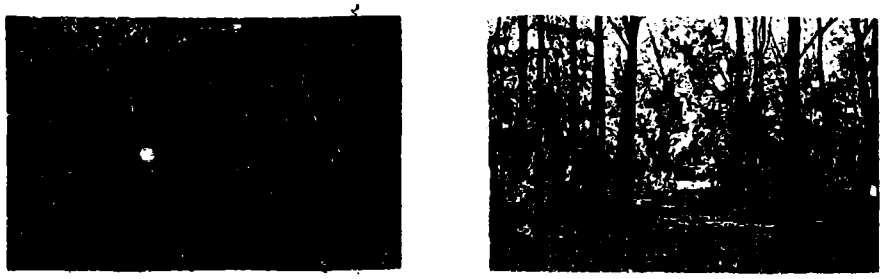
As the first step in analysing the effects of the slide exposure each groups post slide ZIPERS scores were compared with their scores at the beginning of the experiment.

Unexpectedly, the results suggested that the group shown urban scenes felt somewhat worse after the slide viewing. In sharp contrast were the results for the nature scenes where the post slide scores reflected a consistant pattern of improvement in well-being.

A direct comparison of the nature and urban scenes clearly supported the conclusion that they had different effects on the subjects emotional states. The summary was that stressed individuals felt significantly better after exposure to nature scenes rather than to American urban scenes lacking nature elements. This was so in respect of all the factors though some were more significant than others.

One implication at the most general level was that outdoor visual environments can influence individuals psychological well-being. We note that the selection of nature slides were strong in the depiction of vegetation many being exclusively devoted to its depiction.





EXAMPLES OF THE NATURE PHOTOGRAPHS
ULRICH, R. (1979)

4. PLANTS, COMPLEXITY & PLEASURE

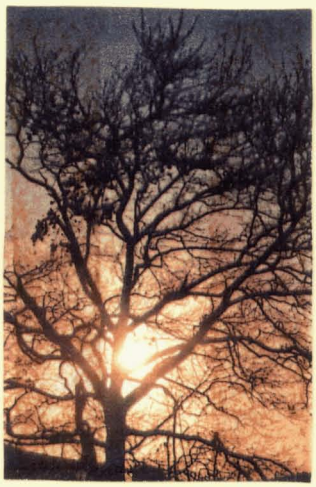
Progressing in this review of studies is one headed "Plants, Complexity and Pleasure in Urban and Suburban Environment" by Thayer and Atwood. The paper opens with the statement "Perhaps no other component of the man inhabited landscape is more widely accepted by the public than plants. Trees, shrubs and other landscape plants have been incorporated into the design of urban areas since the beginning of civic history. Recently scholars have suggested that plants may be a partial solution to stress caused by todays urbanised environments." (Gold 1977, IItis 1973).

The writers were more intrigued with the development by landscape architects of their own design theories as to the aesthetic and psychological benefits provided by plants. These were considered largely intuitive and unsubstantiated by scientific research and provided a source of testable hypothesis. Two were chosen. The first, to establish whether plants generally increased pleasurable response to all landscape contexts and the second, a more technical exercise to see whether there was a relationship between pleasure and complexity in any or all of the contexts.

Six pairs of photographic slides representing five different urban or suburban landscape contexts (residential, industrial, urban commercial, strip highway, park) were selected one without plants and one with plants. Other variables were held constant for each pair.

Attempts to define theories of human responses to plants were noted to have appeared following the general paradigm of a hierarchy

of environmentally significant levels. Simplified these comprise:-



a. Presentational level - on which plants function as concrete entities possessing form, colour, texture and other "meaningless" qualities.

b. A referential or representational level- on which plants are perceived in terms of; recognised function, symbolic associations or other "attatchable" meanings.

For example a tree may be a composition of light and dark, texture and outline etc.

On another level a tree may be a symbol of nature or provider of shade.

Three assumptions regarding human response to plants were distilled from the work of Robinette;

1. Plants may increase the publics pleasurable response to environments by adding positive meaning or diversity thus, plants may act in an "additive capacity".

2. Plants may increase pleasurable response by masking "ugly" portions of the scene or chaotic portions of the stimulus field. Plants, then, may act in a "subtractive capacity".

3. Plants may function on an "interactive level" by tying diverse, unrelated elements, giving an overall unifying effect.

To summarize plants can increase pleasure by adding, subtracting or interacting with other landscape elements, and they may accomplish this by altering either the presentational or referential characteristics of the stimulus field.

Having regard to earlier experiments in the wider field Thayer and Atwood were interested whether similar biases could exist with regard to plants and their use in the landscape. The biasis were towards a natural environment being more pleasurable than a built environment. Plants were assumed to represent a natural environment from which it was expected that an environment with plants should be rated more pleasurable than similar environments without plants.

The response in all contexts confirmed this.

The study on the relationship of complexity and pleasure arose from one of the four sets of preferences spoken of in personal response to the environment. The one of mystery has been referred to in an earlier study. Others are

<u>legibility</u> viewed as a kind of reassurance or indication one can manage an environment yet to be encountered or formed.

<u>coherence</u> making sense of an environment being able to organise the field and divide it into units which match known and appropriate representations and complexity.

<u>complexity</u> the attribute of preference chosen for the study

LEVEL OF INTERPRETATION	MAKING SENSE	INVOLVEMENT
THE VISUAL ARRAY	COHERENCE	COMPLEXITY
3-DIMENSIONAL SPACE	LEGIBILITY	MYSTERY

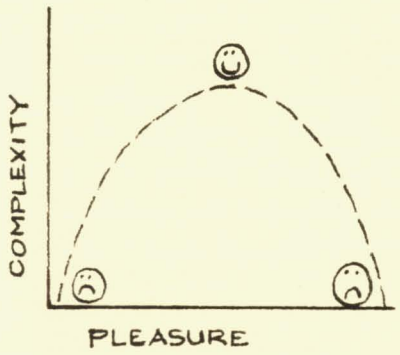
Relying on Robinettes above assumptions and statements by other writers the following was tested:

The condition of plants;

a. increases the complexity of monotonous landscape

b. decreases the complexity of chaotic landscape

c. has little effect on moderately complex landscape contexts - thereby optimising pleasurable response.



There was partial support for the first hypothesis the second was not supported and the third was supported.

The study was designed around the previously tested and proposed inverted "U" shaped function between complexity and pleasure that had been put forward by other researchers. However, this particular test is somewhat sparing in approach and the paucity of material is questionable in its adequacy to cope with the model mentioned above.

The general proposition signalling plants as the important ingredient in appreciation of nature supported the contention that plants have a psychological effect at least of pleasurability in all contexts used.

A phenomenom in the New Zealand community is the increasing presence and bouyancy of nursery and retail outlets and hiring companies devoted to the growth supply of indoor plants. Why this should be so whether the growth is a fad of decoration or fulfilling a psychological need deserves study.

In a relatively unsophisticated way an interview technique and questionnaire was prepared to examine a range of respondence from workplaces where indoor plants were present and in those where they were absent. Particular concern was taken with work places from which there was little or no external aspect an environment sealed away from communication with "nature".

In some there were living plants in others artificial plants. The interviews were designed also to ascertain whether any importance was attached to the difference.

This study is incohate and incomplete but was tending in certain directions. All interviewed were positive in their appreciation of plants being present in the work environment. There was a definite distinction in this appreciate between the living plants and artificial plants. They distinguished between plants and other forms of decoration and objects of interest e.g. sculpture and paintings. The reasons for the appreciation were not categorised and remain a matter of surmise until the study can be refined and progressed.

The experience of a supplier and designer

referred to the stress caused when for various reasons plants were removed from offices.

While it may seem that the above review is a little distant from the topic of the psychological effects on the well-being of people there has been a progression with methodology through general response to nature stimuli to research results that are specific to plants and responses to them. Though not labelled psychological responses the testing methods have been adopted from psychology and are concerned with perception which is an area of psychological assessment.

CHAPTER SUMMARY

Subject to the criticisms appearing in the next chapter we find value in the studies done using the psychological testing method of introspection. So much can be taken for granted as axiomatic when the reality may be myth. To answer the questions posed in this chapter experimenters have seriously applied accepted techniques. Inventive theoretical bases have been postulated to ground the studies and much wise igenuity is shown. There are weaknesses but all of the work supports the reality of what the landscape architect must rely on namely that there is an effect produced by plants and vegetation that is among other effects psychological and in most instances the effect is for a persons well-being.

CHAPTER 6

CRITIQUE OF CURRENT PASSIVE METHODOLOGIES

This chapter gives a critique on the methods adopted in many of the experiments of the previous chapter. These depended on a single mode of sensory reception. The measurement of subjects applied values to representational scenes not real scenes. This method omits some very important aspects of understanding the individuals response to the natural environment.

An approach which guages not only the individuals view of the natural environment or vegetation and the relationship between plants and themselves but which looks at the individual themselves and how they are feeling at the time of the test is needed in determining any psychological effect.

CHAPTER 6 CRITIQUE OF PASSIVE TESTING METHODS

Most research done in human response to the natural environment or vegetation involves the use of preference testing where preference can be viewed as the outcome of a complex process of perception and reaction to what is proposed to the individual or group.

Such preference testing has for the most part utilised photographic representation of environmental settings. This can be seen by the experimental evidence mentioned in the previous chapter.

Care must be taken in adopting such a technique without ascertaining its possible influence on the study itself. It can do this by determining the approach and even the question of the study. Further it can lead to a witting or unwitting management and manipulation of the response. To adopt such a technique without giving due regard to its implications because it proves easy to administer to a large population and is efficient, not too costly and shows some promise in the evolution of data is easy to do. It is also dangerous to assume such a techniques validity and reliability based upon its popular useage amongst many researchers.

Stephen Kaplan makes an interesting observation in his paper "Perception and the Landscape: Conceptions and Misconceptions" in which peoples' reactions to a setting are looked at with regard to

a. what sense they are able to make of it

b. what interest they are able to find in it.

These categories arising from discussion in which two universal underlying purposes adopted by people were proposed, they being "making sense" and "involvement". (In psychological terms these could be translated as order, security, closure and curiosity, challenge, stimulation.)

Mention was made of two ways in which people visually assess an environment, one applying to the two dimensional pattern or picture-plane, the other the unfolding three dimensional pattern of space. Both of these processes occur similtaneously in experiencing a site. From this information it is believed that photographic surrogates of a scene are adequate substitutes for the setting for

preferential testing. However, it is further debated that the assessment of a scene at the picture plane level is too heavily reliant on the attributes of coherence and complexity (these two terms have been defined in the previous chapter). The perceptual approach of the individual to the three dimensional environment is based more upon legibility and mystery. It is noted that all four are representative in scenes of preference though with variable weightings given to each and as such the opportunity for recognition in such areas must be presented to the respondent for valid appreciation of a setting.

Landscapes are more than merely three dimensional and the ability of human kind to perceive depth from an early age is indicative of the importance of the spatial quality in an environment, both the volumes and the voids. It is the spatial dimension that people move through and in which people and natural elements function and it is in this realm that interaction between people and plants is fully realised. It should be noted that this spatial dimension is inextricably linked to the temporal dimension which is also measured by the person. It is preceisly this that cannot be portrayed in a two dimensional photographic surrogate.

logical sense time tends to get mixed up with space, and immortality and infinity are projected against the background of the permanent, relatively unchanging earth. As a support for his own immortality strivings, man needs the sense and the security of the timeless duration of nature.

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Certainly the photograph captures visual clues of depth in shadows and overlap but sequential views, movement, growth, change, mood all important aspects in assessing landscapes have yet to be successfully involved in such photographic preference testing. This experience and sequence is important to the manner in which a person builds up a picture of, and perceives an environment. In being accomplice to an experiment self choice may be deprived and control of sequence and exposure by the experimentor would further influence the individuals response. Not only is the spatial element inadequately portrayed, the temporal element too is lacking in photographs. The photograph is the pictorial representation of a capture of an instant and provides a static display of a dynamic feature. Both the respondent and the environment are living entities, growth and change shared common attributes in their interaction and so representation in a static fashion may be entirely inappropriate as a testing method.

Experience, we may see, is compounded of that which we have perceived, that which we are perceiving, and that which we expect to perceive.

Thus we orient backwards in time and space, as well as forwards and find that each orientation gives meaning to the other and to all.

Our impressions of an object or a space are conditioned by those objects or spaces we have already experienced or that we anticipate.

Our impressions change as our sensed relationship changes.

Adapted. John Simmonds. (1961)

Knowledge of the environment, surely, develops as perception develops, extends as the observers travel, gets finer as they learn to scrutinize, gets fuller as they see more objects gets richer as they notice more affordances.

Knowledge of this sort does not "come from" anywhere, it is got by looking along with listening, feeling, smelling, tasting.

Gibson (1979) in Jennifer Roy (1982)

Further to the spatial and temporal restrictions of photographic representation is the limited sensual stimulation. Whereas in an enviornment the visual, auditory, olfactory and tactile senses are used in a combined fashion to experience a site, the photograph can only afford visual stimulation of a setting. Though the most dominant of the senses, it is always acting in concourse with other senses and care must be taken when asking a question or designing an experiment to find answer to a question, that the effect of sensory deprivation does not have a marked influence on respondents preference.

Man is, moreover, that part of nature which has become self-aware and capable of learning and of self-study and of self-direction. Indeed, human beings have succeeded so well as thinkers and doers, as symbol users and culture makers, as fabricators and shapers, as inventors and constructors as to unwittingly place themselves conceptually outside of nature.

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One other point is that respondents in judging photographs are so doing from a position of detachment. They are removed from the actual reality and may thus judge the photograph with respect to the photograph itself in terms of balance, order, variety, line and form etc, and not with respect the scene depicted.

The context of the scene is also important as expectations change for different areas, residential playgrounds and forest parks affording different opportunities to different groups of people, and must be made consciously a part of the experimental design.

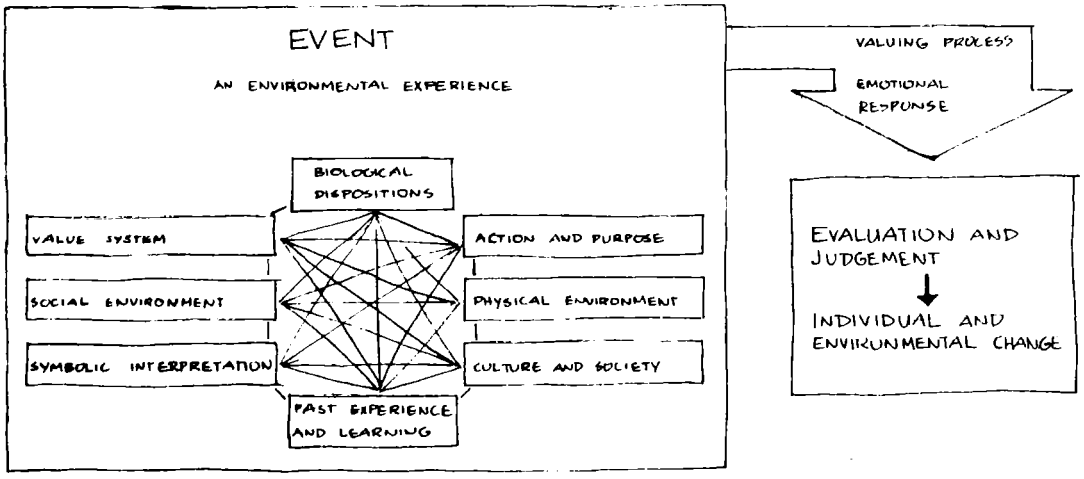
All the above are dangers inherent in some of the photographic testing methods used in the previous experiments. Those experiments where the experimentor was dominant in selecting the scenes and photographs and in the order of viewing, are the most restrictive and directive of response to the particular hypothesis under study. Those where the subject themselves sort through a selection of photographs and ranks them as instructed but according to their own preferences are less restrictive. And those where the subjects themselves are invited to take representational photographs of a setting giving reasons for their choices, enable actual experience of a site and pictorial rather than written description of preferences. This latter form the least restricitive may prove illuminating to many studies though interpretation and administration difficulties and costs would disfavour this approach.

As a sample of the type of study that has produced some conclusions in both methodological technique and data on people/environment experiences Levi's paper seeks to develop a theoretical experience of environmental quality.

There was an attempt to develop a more holistic framework to explain the relationship of peoples valuing process and their experience of environments. The framework used both experiential variables (mergence and barriers) and abstracted values (beauty, health, freedom) to explain the judgement of environmental quality.

The differences between built and natural environments were examined. This was acheived by discussing the physical, social, functional and symbolic aspects of the environment.

The researchers had first carefully to examine the concepts going into the framework. They grappled with perspectives and chose as suitable a transactional perspective. This perspective examines the human valuing process and its relationship to value systems and judgements.



THE PROCESSES ENTERING INTO THE EXPERIENCE OF AN EVENT FROM A TRANSACTIONAL PERSPECTIVE WITH EMPHASIS ON THE VALUING PROCESS.

Levi's study had not been applied to the study of environmental quality. The underlying assumption of the perspective is that the experience of the environment and environmental quality is determined by the transaction (rather than interaction because people and their environment are mutually dependant systems) between the individual and the plant.

There was reconsideration also of objective and perceived quality of the division of the environment into natural and built, the

physical and social environmental experiences (mergence and barriers) and the common descriptions of factors which influence experience of environmental quality both high and low.

Such methodology preceding research is important to the reader. Concepts and approach used are first defined. The subsequent setting of results is clear and cannot be transposed as answers in a different setting using different approaches and concepts.

The issues in this research took people to examples of high and low quality built and natural environments. They were interviewed about their experience of the environment and environmental quality. The interview used both an experiential and a values system approach to examine the environmental valuing process.

Respondents were also given the task of taking representative photographs of the area, with instruction to avoid concentration on representative features and artistic setting of the photographed scene. These photographs were interpreted not only by the testor but by other members of the group, all of whom photographed only one of the sites they visited.

Each subject was taken to the sites in different orders so that no site was being assessed by more than one subject at a time, thus introducing some variability both temporal, climatic and in viewing order.

The results give some global evaluative responses that were typical for all of the environments but the orientation of the valuing process was found to vary across the environments. A system of ratings were used to establish the positive of the negative feelings towards environmental quality. The emphasis was on the relative importance of factors e.g. physical, people involvement and possible activities, naturalness of environment, awareness of human modification, relationship to environment, psychological barriers, perception of beauty, health, freedom and familiarity.

The conclusions that satisfied the researchers were that by focusing on the valuing process, the value system and experiential approaches to environmental quality appeared to be complimentary. The union of these

alternative perspectives provided a more complete understanding of the perception and experience of environmental quality. Further human experience of differenct environments is understood through considering the degree of interdependance of physical, social, functional aspects of the environment.

The simplified value system used, relating environmental quality of peoples' feelings and their judgements of beauty, health and freedom disclosed those values to be interdependant but having varying importance depending on the type and aspect of environment being examined.

A check on use of photographically stimulating environments was conducted and found adequate in this experiment as providing surrogates for study of environmental quality. There was a caution that vegetation obscuring the built aspects of the environment in the photographs limited the use in respect of perceived environmental quality. Such a study while not directly related to the psychological effects of plants nevertheless helps to establish a framework upon which plant questionnaires and interviews could be established.

In testing for psychological effects the measurement of the subject in terms of their own emotions or personality at the time of testing as well as in response to the stimulus may show a correlational pattern. Psychologists have developed many good personality tests. This combined approach as seen in Urlich's study with the use of the Zipers' test could well be incorporated with the preference testing methods utilising both the experiential and value systems.

There has to date in the field of environmental psychology been little testing using such a method. The interpretation would be quite laborious which may be a factor deterring its use.

"We may well be left with a society which mirrors the techniques by which we measure it and echoes the language in which we talk about it"

Olsson Gunnar
Stewardship Landscape Architecture
May/June pp 4 - 51

CHAPTER SUMMARY

Use of the photographic preference testing technique may be found wanting in determining a persons real values and attitudes to areas of greenness, vegetation etc. Nevertheless their contribution should not be completely overlooked. Photographic surrogates in conjunction with other testing methods:

questionnaires and interviews designed to determine a subjects emotional state and values system at the time of testing,

observation of behaviour in an actual site visit,

may be of considerable value in appraising with more accuracy the subjects response to their environmental surrounding.

The sensual quality of trees - their feeling when one walks around, under and beyond them - is as important as the visual quality. Trees on a street must refresh the senses as well as the mind.

CHAPTER 7

ACTIVE PEOPLE/ PLANT TRANSACTION

In addition to the scientific studies based on a more passive introspective methodology this chapter looks at psychological effects of active involvement of people and plants. Testing methods employ both introspection and observation of participants.

Although a wide range of individuals were involved most had an interest in that which was under test. And although subjects were individually merited, group interaction was one of the important features in each experiment.

Postulations as to the therapeutic values of such active involvement has recently received much attention in some American Universities where courses are offered in horticultural therapy. There is still much research required to determine the exact effects of person plant and people plant transactions.

CHAPTER 7 PSYCHOLOGICAL EFFECTS OF PLANTS ON PEOPLES WELL-BEING

So far this study has progressed the proposition that plants have a psychological effect and that generally this has been for the well-being of people at least and has contributed to pleasure. Although studies such as Ulrichs go further and Thayer and Atwood hint at some therapeutic value by adding variety to monotony.

In all this the human person has been tested in a passive role. This is an immediate reflection on the methodology but it is important to remember that the transaction process referred to by Levi bespeaks involvement on the part of the subject, an "entering into" the environment and indeed being a participant in it.

This picks up the point made by Ittleson in his book "Environment, Perception and Contemporary Perceptual Theory" again dealing with the distinction between object and the environment. The environment is not an object requiring subjects. One can only be a participant because "the environment, surrounds, enfolds, engulfs and no thing and no-one can be isolated and identified and apart from it". (Ittleson; ibid.)

But there is more to it as disclosed in a paper by Lewis. Lewis's study showed development into active work on the part of people in using plants to give order and coherence in a degraded environment.

Plants though not distinct from that aspect of environment code-worded as nature, greenness etc are objects that can be placed in the care of the individual, nutured, developed and made part of an individually created micro-environment related to that of greenness etc.

BRATHWAITE, ERROL. NEW ZEALAND AND ITS PEOPLE. GOVT. PRINTER. (1974). PP 73

Gardening is a leisure activity. In it the natural environment plays a central role. Is there a rest and recovery, a healing component in the relationship?

Racheal Kaplan turned her mind to this in her paper "Some Psychological Benefits of Gardening". She stated that nature was an essential component and not a background which might be ignored by the participants. Further it required a continuing contact and so represented a commitment rather than a

The proper environment is a healing environment. It is a place where ancient linkages between person and plant are re-established and we find fulfillment.

Lewis (July 1979) pp 337

chance or casual experience with the outdoor environment. Finally it is a close at hand form of leisure activity. It was said this tends to both decrease its "image" value and to increase its potential role in an individuals psychological economy by its very acceptability and frequency of contact.

The universality and the appeal to such a wide variety of people raised questions.

Are the rewards of gardening unitary?

Is there a core, an essence to the gardening experience that touches all who participate?

Is it instead, that there are a variety of different benefits?

Are different people involved for different reasons?

Is the intuitive expectation, that the two major benefits are

1. fascination,
2. satisfaction in harvesting ones own food?

Anecodotal data suggested conclusions but R Kaplan was concerned to submit these to a proper study.

Two major groups namely community gardeners and home gardeners were studied with plot gardeners included in some of comparisons.

Having established the nature of the sample groups a method of interviews/questionnaires was used with the respondents generally completing the material themselves. Apart from questions on garden benefits an Environmental Preference Questionnaire was used for all groups.

Based on responses of ninety-six completed interviews, scales were constructed using accepted analysis programmes. The tables included questions on:

1. Primary garden experience
2. Sustained interest and
3. Tangible benefits.

Allowing for variances of age, experience and garden type etc common results were revealed.

Three catagories of psychological benefits were identified as arising from the gardening experience.

1. Tangible Benefits - such as the enjoyment of the feeling of producing food for oneself.

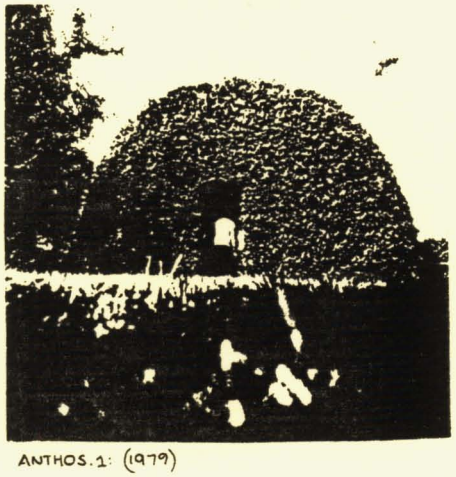
Cutting food expenses and harvesting, were obvious from the results under the heading gardening experience as to why people gardened. Women home gardeners found the greatest satisfaction from nature settings. The findings suggested a need for further research.

2. The "sustained interest" scale reflected the idea of gardening as a source of fascination. Although flower gardening was the only gardening comprising this scale the response suggested that the scale may tap the aspect of fascination that seems so essential to any activity.

The interpretation was itself, supported by the finding, that, flower growers scored so much higher in it. Flower growers were the older and more experienced gardeners and Kaplan surmised that there was development in gardening experience from vegetable growing through to flower cultivation. That fascination developed, required a level of competence, which like self knowledge, took some time to aquire.

3. The "nature" scale responses supported the idea that gardening plays a role in peoples lives not unlike that played by more dramatic, more distant and less frequent encounters with nature. Kaplan ends with reflections that gardening

1. calls on the basic informational processes of humans which encouranges activities to be well done and presumes a dedicated care.



ANTHOS.1: (1979)

2. is a nature based activity and that nature per se has been shown to be the object of preference to a striking degree.

Both these virtues, the informational and the natural are in the garden setting, concentrated and intensified. The garden is a miniature, a slice of nature compressed in space and a pattern of information compressed in time.

Jackman likens the frontyards of today, of carefully tended trees and lawns as the residue of pasture that followed deforestation. Time has transformed the reality of a wilderness into myth. Thus the lawn, an area of sociability, replaces the common which was an area of production and play. The common in turn replaced the forest which was largely the unknown but in its peripheral bounds was a provider of produce and play.

A study such as Kaplans is helpful in that it gives a base to the considerable anecodotal material, suggestions and comments as to the role that gardening plays and the psychological benefits if offers.

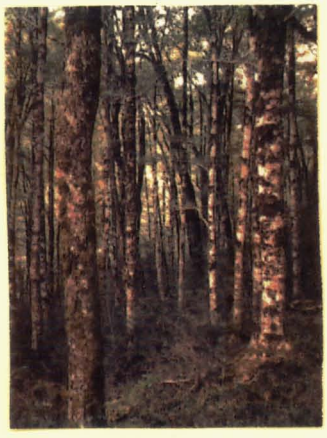
LEWIS, C. (1979)

In practical terms garden therapy has become an area of study in many American Universities. It was noticed that actively caring for plants in hospitals for the elderly increased longevity among patients. Similarly such active caring in prisons and apartment blocks has not only given positive direction for energy but because of its particular nature and relationship to nature, it has softened not only the environment but the community.

Another active pursuit of people involving intimate association with plants has been examined by Stephen Kaplan and Janet Frey Talbot in a paper entitled "The Psychological Benefits of a Wilderness Experience". This topic falls into the recreational field.

Trees in the forest.
Their aesthetic values involve more than symmetry and texture in the play of light; for they are among the oldest as well as tallest living things on earth.

Environmental Aesthetics (1982)



Although an active relationship between people and the wilderness, for the most part the wilderness comprises of trees in a forest context. Thereby it differs vastly from gardening in which natural elements including plants are manipulated to a pleasurable pattern. Though the forest itself is subject to human manipulation the trees are at such a scale as to form a pattern of information that must be learnt and absorbed by respondents entering into intimate contact with the habitat so created. In perceiving the entire environment, vegetation can not be abstracted by participants. Indeed as shelter, air movement and gaseous content, sounds, food sources, wildlife refuges etc are regulated by the vegetation patterns and a certain ambience achieved a deep understanding is necessitated between participants and the environment.

Again commitment proves a requisite which precludes chance experience. The intensity

and enveloping nature of contact effectively shuts out other distractions increasing the place trees have in the psychological heritage of the individual.

What is the interest in such a recreational pursuit? What are the expectations involved and benefits gained? Do these differ for different people?

Results from early testing using survey methods based on the above questions suggested enduring changes in self-esteem could result from wilderness experiences. Kaplan and Talbot were interested in exactly what changes the wilderness experience had on the individual and the nature of these changes. A long term study based upon the wilderness experience enschewed. Evidence collected over the years since 1974 has persued differing areas of concern from the initial verification of posited effects of a wilderness experience to determining whether the effects are long term enduring beyond the subjects actual contact time in the forest environment.

The experiment was called the Outdoor Challenge programme and involved two weeks back-packing through some dense trailless wilderness with swamps and small lakes and largely unspectactular in views.

The programme was aimed at focussing participants concerns on the environment. Emphasis on was understanding survival techniques and working through ones own fears and consisted of initial instruction in map reading, compass use and setting up of camp. Followed by a week group hiking with leaders then a two night solo experience designed to provide opportunity for comtemplation. (It also proved to be a condensed and intensified version of processes that occurred throughout the entire trip). Finally the group hike without leaders back to base camp.

All participants were issued with journals in which they were to note down any feelings and reactions to experiences on the trip. These journals were to accompany individuals everywhere. Questionnaires were filled out along the trip before and after solos and immediately upon arrival back. Some partipants were approached and requested to keep journals for a few weeks after their encounter with the wilderness in order to determine any persisting memorable effects. Outside of the wilderness environment.

The participants themselves made up a relatively varied sample of individusals, local high school volunteers, adult volunteers all, however, expressing an interest in the programme, and responding to brouchures, public announcements and the like. Few of whom had ever done orienteering or extended back-packing. The size of each group varying between 3 and 12 with at least 2 leaders.

Findings from the questionnaires indicated that participants learning and adeptness in the forest environment was rapid.

Anxiousness about how to survive and the threat proferred by the woods diminished early in the trip, with only more subtle fears persisting through the first week. They did not feel the need to increase their sense of control in determining activities in the wilderness and had confidence in their knowledge and skills very early on.

Understanding of social and physical surroundings continued to increase throughout the trip.

Most of the participants were satisfied with their experiences and felt they had gained an increased sense of purpose in general. Their desire to be intensely involved in a variety of interests also showed an increase over the trip. Many said they were glad to have shared in a rare opportunity to live naturally in their surroundings.

The analysis of the journals proved more difficult in that there was great deal of variety amongst them and the "eloquence" of many led to the need of a much broader focus of inquiry. Overall participants rather than just learning skills, coping strategies etc.... were learning new ways of thinking especially in areas concerning their place in the world and relationships between the world and the individual. After much analysis a generalised pattern of findings was disclosed. As in questionnaires early anxieties, ability to perform and co-operate in groups, unfamiliarity of surrounds were quickly dispelled. Enjoyment and full absorption with physical activity were next mentioned followed by time out to do nothing. There was also an important sense of a different sort of temporal rhythm.

There is another more subtle human need for the natural environment that has to do with the experience of permanency and of change.

Man and Nature in the City Symposium pp 5-6

Fascination was an important factor. It was not an instantaneous response but grew with

Richard Meier describes this over-abundance of noise as a -

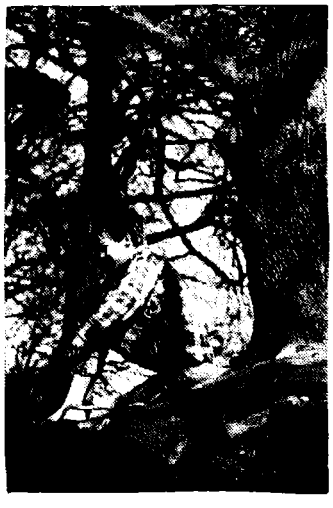
"Special form of harassment which results from man's being the target of too many messages - too much communication from too many sources. An information overload that exceeds human capacity to absorb and handle it causes mounting disorder and confusion, and finally a desire of the individual to cut all connections with society, to escape."

Man and Nature in the City Symposium pp47

continued contact with the stimulus. Similar to that associated with gardening, fascination arose from sensory stimulation and grew and expanded with self-knowledge and competance. It resulted in effortless concentration on activities or on being a part of the physical surrounds. Fascination without unnecessary "noise" and with no need for input of deep thought was an important response in that it provided the necessary framework for a more profound meaningful relationship between the individual/environment and individual/group.

Later in the trip participants began to mention finer details of the environment and relationships. There was a positive response to the slower pace and natural rhythms. Most important was the developing spiritual awareness, awe and feeling of oneness with nature. Coupled with this was participants growing surity within themselves. Their thoughts tending towards life and their purpose. A common thread suggested individuals overall enjoyment of the forest environment was closely linked to their own appreciation of physical response possibilites and activities with their surrounds.

Proposals put forward by this study considered that the wilderness experience afforded participants



Nature has an enduring impact one human emotion which reaches back to our beginnings and remains profound today.

Environmental Aesthetics. (1982)

1. Tranquility and silence which was important in reducing internal and external "noise" and which reinforced a feeling of wholeness and integration both within the individual and between the participant and surrounding.

2. A place for contemplation which allowed participants to advance an understanding of their self-identity. This enabled a realisation of their part in the world.

3. Peace and integration.

4. Oneness, a sense of being at one with the universe. This was mentioned frequently in the journals and was considered a spiritual dimension of the human experience outside of the sensory or analytical experience. Such a sense facilitated by a forest setting was important in promoting spiritual well-being which was important in creating an ambient framework in which the whole person could function.

We had not expected the wilderness experience to be quite so powerful or pervasive in its impact. And we were impressed by the durability of that residue in the human make-up that still resonates so strongly to these remote, uncivilised places.

Kaplan & Talbot

5. Wholeness.

While most literature on such values has been consigned in the religious context. It should be noted,however, that these attributes have received attention in some of the formal Japanese gardens, where there is recognition that there are times that people desire and need peace and quiet and tranquility.

CHAPTER SUMMARY

Active physical contact with plants in either, the person dominant controlled gardening sense, or the vegetative dominant wilderness experience, have both been subjected to research to determine the possible effects on the person. These active pursuits required commitment on the part of respondents which resulted in a relationship of long duration exacting care and understanding.

Such suggested relationships have been shown to be experienced between people and plants and are widely known at some intuitive level by most people but they have not received much in the way of serious attention in any form of psychological literature.

CHAPTER 8

PLANTS AS A SOURCE OF SENSORY STIMULATION

Previous chapters have considered plants as units either alone or more frequently as part of vegetation, greenness nature etc. Whether plants in that context have an effect on the psychology of people has been the study for examination. But such a treatment of plants is not complete. Plants can be analysed into components that impact on the various human senses. The landscape architect synthesises a presentation and therefore cannot ignore an examination of how plants present to the seeing, hearing, smelling and touching human person.

Such a study may seem reductionist in nature when the topic is better approached holistically. No approach should be ruled out if it can assist in answering such enquiries as to whether plants can be categorised and weighted according to stronger or lesser psychological effect.

CHAPTER 8 PLANTS AS A SOURCE OF SENSORY STIMULUS

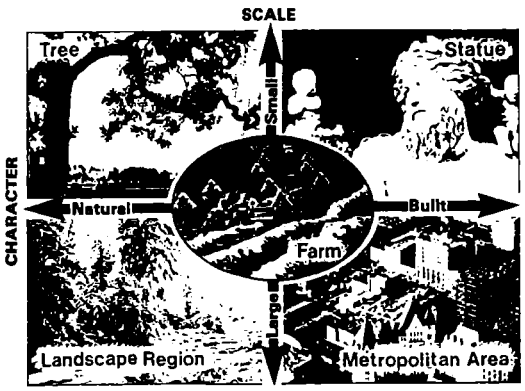
In dealing with psychological effects we are necessarily concerned with some form of sensory stimulation and sensory reception. The human person has five main modes of sensory reception visual, auditory, gustotory, olfactory and tactile. In addition to which there is believed by many to be a largely unknown sixth sense. The activation of the senses by a stimulus produces raw information which is further worked by the brain, from which responses to the recognised stimulus in terms of behaviour may be seen.

Psychology in one field has endeavoured to gain some understanding of how various stimuli affect the person. In the laboratory, or controlled environment situation, experiments have been carried out to determine responses to colour, sound, smell etc. Although not directly involved with plants such studies may provide material relevant to vegetation and to the possible psychological effects upon the well-being of people.

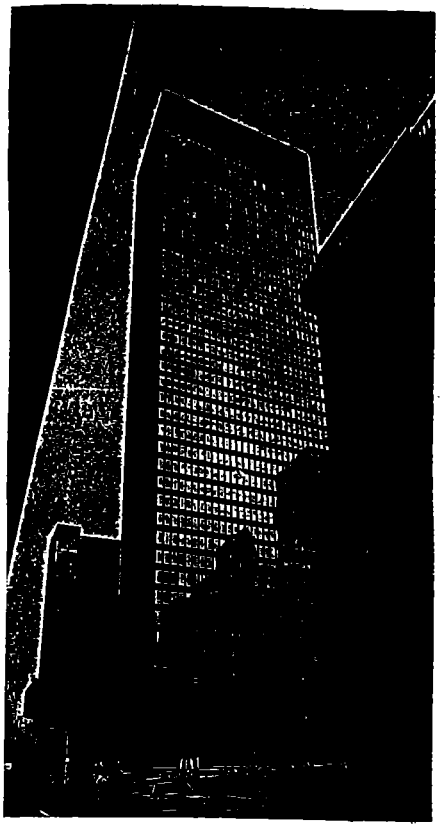
Each person is and each persons interactions are unique. There have been some measurements and generalisations made determining areas of commonality. The following presents a brief description of some findings in certain aspects of sensory stimulation closely associated with psychological effects.

VISION

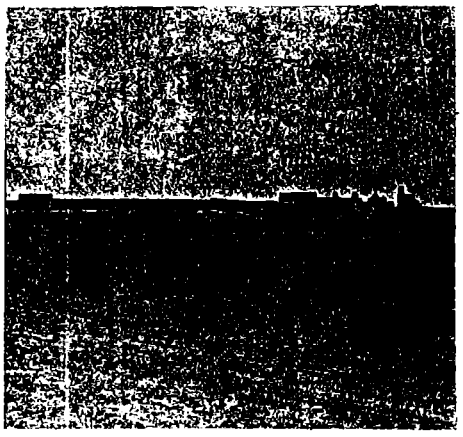
1. SCALE



Sight is the supreme sense involved in information gathering of ones surroundings. Naturally it has been the subject of much study. The use of the eyes does not merely present external surroundings to us. There are two eyes and therefore bifocal seeing and the eyes are fixed in the head which must move to shift the direct field of vision. This has as profound affect not so much on what one sees as how one sees it. The studies consider at least the aspects of plane and distance and the varying effects plants will have on a subject depending on where they are placed, in what concentration, in what relationship to other objects etc....



BAYLEY, S ; GARNER, P ; SUDJIC, D.
© STYLE AND DESIGN (1986) PP 157



NORBERG-SCHULZ, CHRISTIAN.
GENIUS LOCI (1984). PP. 119

Human sight fixes on a plane derivation from which, without moving the head is comfortably accommodated to 25/30 degrees only in the verticle field. In the horisontal field this extends to 180 degrees, but outside the central 60 degrees vision is peripheral and less distinct.

Plane and distance define scale for an individual into foreground, middleground and background. Foreground settings allow for recognition of detail but may not provide a contextural overview. Background provides the overview defining the context but does not allow for recognition of detail.

Just as landscape designers make judgements as to the mix of focal distances and scale in setting plants in positions considered preferable for a person's well-being so we can accept that focal distances and scales do matter.

It has been suggested that in the built-up urban street scapes much of the focal distance is limited to middleground, buildings proving a visual block, the vertical scale of which is largely incomprehensible. This results in lack of legibility of the setting and increases discomfort of the individual.

Large open expanses with no vertical elements provides no focal distance, featural element or sense of human scale. It too results in lack of legibility.

Some studies have shown that preferences are for areas of mixed focal lengths and mixed horisontal, vertical and overhead planes. The nature type parkland and savana settings exacting preference.

One quickly acknowledges that what the eye perceives is space and what fills it. Where plants and vegetation are involved there arises complication and tensions which may be pleasing or not. What is pleasing depends partly on juxtoposition and partly on the combination of surface, bulk, mass, volume and balance where

surface is read as continuous and consistant,

bulk the general feeling of physical presence,

mass the sense of contained weight or expansive pressures,

volume the spatial shape produced by interpreting bulk and mass, and

balance the sense of security in not falling over

Plants as a subject for disposition in space designed to contribute to the well-being of people is a study of some refinement.

2. COLOUR

The perception of colour - involving feeling and emotion - is the property of human consciousness

Faber Birren (1961)

Ability to see in colour aids in detecting distances more accurately.

In detail and distant view colour is dominant in its effects. Colour is light, colour is substance, colour is perception, and is in all of these qualities distinct effecting very different responses. Colour is also a sensation and has thus undergone a lot of investigation in the field of psychology. However there has not always been agreement in its posited effects. Some of the more commonly expressed opinions have been included here but this section is just an introduction to the notion that colour is able to be manipulated and awareness of its possible effects in creating an environment should not be underestimated.

It is believed by some that all cells of the human body are light-sensitive to varying degrees, and that external colour will always have the same effect regardless of cell site. But of more interest is the fact that colour can also be induced internally by pressure on the eyeball. This and after images and dreams etc have excited much research and has recently been adopted by neural psychology and may be regarded as a mental science.

Mixture and balance of colours has received much attention in the field of fine arts and understanding of the various moods that can be created would take a book in itself. Suffice to say here that there is possible 1. a mix of colour primaries to create secondary and these mixed to create tertiary colours or 2. a mix of distinct areas of colours or 3. a mix of tones varying amounts of black and white hence greyness of a particular hue, all of which affect the final colour sensation in the perceiver.

Red, blue, green and yellow are thought to be the set of psychological primaries, each of which is a distinct visual sensation. The

following is a description of some of the associated psychological effects of these primaries.

Red has been renowned for causing increased blood pressure and cell constriction and is thus an active exciting and stimulating colour. Red normally focuses at a point behind the retina, causing the lens of the eye to become convex and to pull the red forward making it appear larger and closer and is thus categorised as an advancing colour. It also tends to segregate better than blue creating more distinct edges. Red has strong symbolic association with fire and is termed a warm or hard colour. Under the influence of red, time may be overestimated.

Blue is a cool or soft colour and diffuses better than red. The blue sky is thus formed of highly scattered light. Blue focuses in front of the retina and causes the eye to flatten and to push the blue further away and so blue is termed a receding colour. It is difficult to focus and affords low attention. It also causes time to be underestimated. Blue is a passive colour non stimulating. It is subdued in effect possessing calming qualities.

Yellow is again a warm colour and in some cultures has strong symbolic association with the sun. It is considered a bright colour and cheerful. Its hue is sharply focused by the eye and it is generally found to be of neutral effect and is thus favourable upon human metabolism. It has been said to affect curiosity especially in young children and encourages approach.

Greens psychologically represent a withdrawal from stimulus. They are considered a neutral colour, and provide an ideal environment for meditation and concentration. Green is strongly associated with nature, the natural environment and vegetation. Green is the only colour to focus directly onto the retina and is thus a relaxing colour. It is split into two categories, the yellow-green and blue-green, both of which have slightly different effects. Yellow-green being neutral though more vivid and arousing and blue-green, more subtle and contemplative, is considered most pleasing and liveable.

There is much documentation available for secondary and tertiary colours their

densities, extent of area coverage and juxtaposition with each other but these will not be dealt with in this dissertation.

It can be seen that individual's response to colours may be dependant on past associations with them and may be influenced by their cultural heritage. The notion that colours affect the psyche and knowledge of colour manipulation in mood creation may well be made use of in planting designs.
These proposals look at individual colour effects and are taken from a static situation. When dealing with vegetation we are involved with a living colour field, one which is constantly undergoing change.

The basic background in most areas of vegetation is green and as has been mentioned it is a colour affording meditation, relaxation and it is within this matrix that all other colour effects occur.

Continual movement and change in the colour plants exhibit and the liveliness of the colour are qualities that have yet to be understood. The quality of colour the surface and the texture of the foliage the light conditions all play an important part in colour perception and sensation and thus psychological effect. This ephemeral quality provides us with a sensation that is dynamic, defying defination yet providing a pattern that is harmonic. It has yet to be achieved in a man-made environment and has only been achieved upon successful incorporation of natural elements especially vegetation into man-made environments.

3. TEXTURE

In a detailed view texture becomes an important feature, and aids in determining distance.

It is the portrayal of the surface's physical characteristics. The closer to the surface the viewer is the more distinct the texture. Some psychological evidence suggests that different textures ellicit different responses. Smoothness of texture denotes a newness of surface, one on which paint has yet to be applied or time has yet to change. It hints at possible change and thus presents a mood of transition. It is cool, clean and not readily touchable.

Rough textures have age and exhibit a degree of permanence, of maturity evoking a more friendly atmosphere.

As with colour the effect of texture is dependant on the play of light and shadow across the surface, intensities of which vary constantly. Plants as living, moving entities further reinforce this constantly changing texture in their growth, seasonal change, physical movement and apparent movement due to light changes.

The texture is read not only in the plant itself, its foliage shape, size and density, branching arrangement and trunk surface but in the shadows cast by these. As with colour, texture may in fact trick the perceiver. 1. coarse textures like warm colours advance, appear closer and larger 2. fine textures like cool colours recede, appear further away and smaller. Carefully positioned such visual texture may create a range of visually apparent spatial tensions affecting the feel, ambience or tensions of a space a person experiences.

SOUND

The auditory sense is strongly associated with the visual sense, but is regarded as more important as a social sense. Unlike the eye the ear can never be closed and like the sense of tactility is open to constant stimulation. The ear is used not only for hearing but for maintaining balance.

Scientific endeavours to measure sound perception have set some arbitrary scales, the decibel scale and another adjusted for human hearing specifically.

In the field of music there has been much study into sound tones, pitch and frequency and combinations of such and their effects on the listener. Music in fact forms a very sensitive language to the human person with different cultural heritages giving rise to different musical forms.

The qualities of unnatural sound differ in effect to natural sounds. The former requiring extra effort to listen to and translate by the listener.

There has been recent writing by psychologists under the umbrella of environmental psychology on the relationship between noise and stress.

There is very little noise that comes to us that doesn't have some information content, and much of what bothers us about noise is such content.

Man and Nature in the City Symposium pp47

Noise defined as unwanted sound is prevalent and continuous in the urban environment today. Much noise is of a mechanistic quality traffic, radios, televisions etc all of which constantly battle for attention. Such a concatenation of sounds carries with it excess and redundant information and is distracting if not overwhelming to the listener. Psychologists have shown with school children that extraneous external noise leads to extraneous inner noise and results in loss of ability to concentrate and comprehend tasks at hand. This seems to vary with age both the young and the old age groups showing more extreme distraction.

Trees either directly or indirectly are producers of natural sounds, rustling of leaves and by attracting bird life, encourage bird song.

Trees are also known in their technical capacity as buffers to unwanted sound. As was mentioned in the Wildlife Experience Study, trees in the forest context afforded individuals peace, silence and tranquility both internal and external. This enabled individuals time and space for contemplation and concentration.

These arguments coupled with the known need by people for times of peace and quiet advocate the setting aside of areas of naturalness away from the hubbub of urbanity.

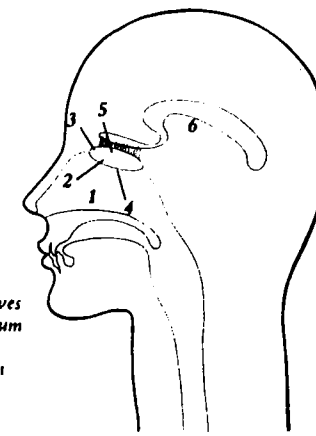
SMELL

The olfactory sense, one of the least understood of the human senses and one of the most ephemeral, is a strongly persuasive sense and is closely associated with memory. Knowledge of odour perception and odour memory has hardly progressed in experiential or phenomenological fields due to its ephemeral nature.

Most testing of aromatic effects lacks reliability in that such tests are seldom repeatable. Thus scientific endeavours have produced little in the way of conclusive findings.

Odours travel directly through the olfactory receptors of the nose to the limbic area of the brain which also functions as the learning, emotive and memory centre. This promotes the widely held belief in the power of smell in triggering vivid memories. Such

a relationship would play an important part in odour associations which for the individual would incite a psychological response upon such sensory provocation.



1 *Air containing odor molecules passes bony turbinates*
2 *Odor molecules are picked up by hairlike odor receptors called cilia*
3 *The cilia carry the smell message to the olfactory nerves*
4 *The message goes to the base of the olfactory epithelium*
5 *Odor interpretation begins*
6 *The interpretation is routed through the limbic system of the brain*

Perfumiers over the years have tried to capture and categorise aromas. However, description of certain smells varies widely and though a number of systems have been posited no one universal categorisation has yet been accepted. In a more recent study by Avery Gilbert and Charles Wysocki (National Geographic October 1987 pp 514-525) six odour categories were alluded to as being readily discernable by human persons. They were body odour (sweat); fruity, spicey (aromatic), floral, musk (ambrosial) and gaseous, and were found to be agreeable, foul, foetid, or nauseating.

Most easily, acutely and accurately detected was the floral aroma, for which rose was the representative scent. The spicey (cloves) and fruity (banana) scents followed.

Results from the survey indicated the sense of smell to be sensitive to aroma detection though not so sensitive to its discrimination. This failure to clearly discriminate between aromas may be due to the lack of dependance on the sense of smell for survival in todays built-up environment. Yet it is evident that smell is indeed of concern to the person.

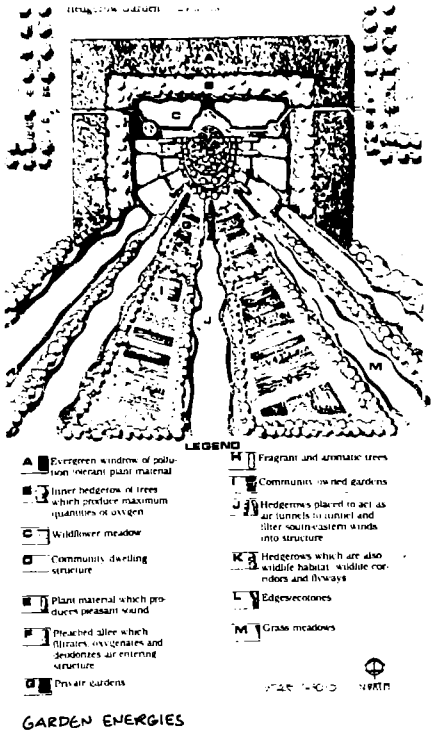
The sense of smell is extremely sensitive and dependant on full bodily health. Most people experience at least temporary loss of this sense due to minor disruptions of other bodily functions.

Sensitivity to detection of odours was shown to decrease with age, though this should not be translated as reduced need or desire of those of greater age for experiencing pleasing aromas. Indeed the association of smell with memories and the obvious plethora of such by those of increased years advances the importance of such a sensate.

The aromas of the ghetto aren't those of field flowers or of a virgin forest. Rather, as Richie Havens tells it in a popular folk song, "Choked cities yell and rage in fumes and gas."

Man and Nature in the City
Symposium pp47

The aromatic quality of plants is one which requires a lot more attention especially when one considers, 1. the long tradition of growing and gifting treasured perfumed flowers, 2. the use of extracted flower essences in perfumes especially that of the rose, 3. the more recent work done in breeding flowers to further enhance their perfume. These factors indicate the importance of pleasing perfumes to people, and in todays urban environment it seems a shame to find it a luxury item.



GARDEN ENERGIES

However, plants are not only appreciated for perfume in their own right but also for their technical capacity in masking less pleasant smells emitted close by. Design of such areas around the source of the offending smell requires skill in plant placement to utilise local wind patterns in dispersing and dispelling the smell and skill in plant selection for their odiferous value.

Aromatherapy makes use of such floral aroma as part of a healing process, where massage and essential flower oils are combined to affect a treatment. Although effects are not well understood some documentation has begun and may provide some insights as to possible effects of specific aromas under given conditions. Such findings could be of use to the landscape designer.

The olfactory sense has not received the attention due to such a sensitive sense.

TOUCH

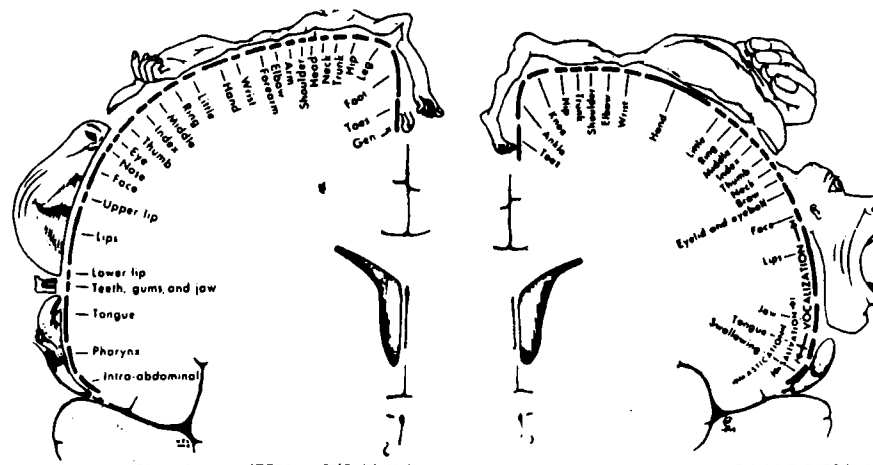
Touch is the parent of our eyes, ears, nose and mouth.

Touching: The human significance of skin (1971)

Skin which is immediately exposed to the environment houses the tactile system. Unlike other sensory organs it is not restricted to the head but covers the entire body. It is therefore of prime importance in experiencing an environment yet it is a sense

largely unappreciated. Much information acquired through this sense is not consciously assimiliated until warnings of discomfort arise.

This sense is in fact the first medium of communication between the person and the environment. It forms the reception centre for heat, cold, touch, pressure and pain. It is the human measuring system for atmospheric enviroment and air movement, temperature, humidity, light and radiation. It is the most alert of all the senses and is the first to recover after awakening.



SENSORY RECEPTION CENTRES IN THE BRAIN RECEIVING IMPULSES FROM THE SKIN

MOTOR RECEPTION CENTRES IN THE BRAIN RECEIVING IMPULSES FROM THE SKIN

TOUCHING: THE HUMAN SIGNIFICANCE OF SKIN (1971)

The dialogue between skin and the external environment is continuous throughout a persons life. It presents one of the most important senses for learning and experiencing surroundings.

At a young age babies gain information about their environment by touching especially with their hands and mouth, they being the most receptively sensitive. To young children play is a form of very active learning and psychologists following experimentation have concluded that greater regard and feedback are gained from contact with animate rather than inanimate objects. Plants may therefore fulfill quite a significant role in childrens play. They require of the child active exploration, co-ordination and care. Trees may also present a challenge and risk to avid climbers.

The Mind of Skin

The greatest sense in our body is our touch sense. It is probably the chief sense in the processes of sleeping and waking; it gives us our knowledge of depth or thickness and form; we feel, we love and hate, are touchy and are touched, through the touch corpuscles of our skin.

- J. Lionel Taylor, The Stages of Human Life. 1921,p 157

Touch or touching may be variously defined as bringing part of the body, especially the hand, into contact with or to affect with tender feeling, concern about.

Hence touch is not limited to sensation as a simple physical modality but also affectively as an emotion. Feelings obtained by the person from experiencing an environment may be coloured by previous experience affecting feelings accorded by the individual. Touch as concern, and tender feeling between plants and people has not received the attentive documentation as has the physical sensory mode. It is exactly this touching of the person by plants in a non physical way that is the topic under consideration in this dissertation.

In all these various sensory modals, there is a seeking to gain an effect in transaction between people and plants. Not only must the physical environment be catered for in which spatial organisation is imporant (the various senses favoured in the differing proxemic distances; intimate, personal, social, public of the person to plant) but the psychological which transcends the spatial and temporal conditions is also important. The transaction between people and plants is not a simple study for which recipes may be given for arrangement of plants for all people all of the time as Ittleson pointed out in his analogy of landscape. Landscape provides multimodal information both peripheral and central. Landscapes carry symbolic messages and perception of landscapes therefore always involves action. Landscapes always have an ambience and form a part of a social activity having definite aesthetic and systemic qualities. Such are essential to the transactional process between people and the landscape. Vegetation being an essential part of natural environments also provides multimodal information, carries symbolic messages, conveys an ambience and forms part of a social activity, with definite and systematic qualities.

TELEPATHY?

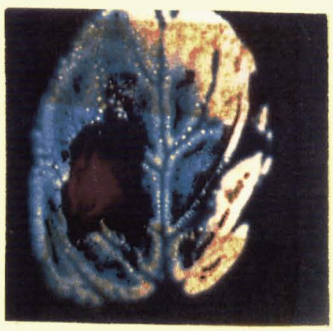
Psychologists have turned their attention at times specifically to plants as living organisms, possibly sentient. The work produced has followed the use of a variety of techniques germane to human and animal psychology.

Most people after reading the results would place these writings in the category of fantasy. The fact that some work results in suggestive and unexplained phenomena and that serious scientists continue exploration in this area leaves the discipline with a question mark.

Cleve Backster well known for his contribution to the book "The Secret Life of Plants" incited much interest and speculation into the response plants have to thought processes. Through many experiments he showed plants to be extremely sensitive to their surroundings. By using a modified pologragh Backster obtained recordings of plants registering apprehension, fear, pleasure and relief. His observations indicate that plants have feelings and that they are able to communicate in a telepathic way with other life forms. Experiments demonstrated their ability to recognise thoughts of malicious intent by a person. Intentions such as harming the plant itself or people in the vicinity are detected by the plant before such actions are carried out. It was also established that plants are capable of forming a rapport with their owner. This relationship transcends very large distances. In one of his experiments Backster showed that plants respond to injury of people nearby or to death of living cells nearby.

HEALTHY LEAF

Further studies verifying Backsters work have been done by a number of researchers notably the Kirilians who invented Kirilian photography. Kirilian photography is a high powered radiation field photography. It produces colour photographic images of the energy patterns of organisms. This energy appears to be present in every living thing plants and people and by unique internal patterning is individual to everything. The energy is not confined to the boundaries of the individuals physical form but may extend outwards a little thus forming an aura. The energy patterns constantly change depending on the physical and mental stakes of the living being.



GASHED LEAF PHOTOGRAPH TAKEN 20 MINUTES AFTER CUTTING THE HEALTHY LEAF

This work is mentioned because there might be a dimension of interaction in which the human being is not the only active participant. For the purposes of this study, however, no account can as yet be taken of the possibility.

CHAPTER SUMMARY

It can be seen that vegetation, and indeed, the tree has much to afford the physical surrounds of the human being as it does the psychological in all its constituent attributes. Bearing in mind that the sum of the parts is less than the whole, a new understanding of these components lead us to surmise that plants are of considerable physical and non physical benefit to most peoples lives. This transactional effect permeates the one to one, one to many and many to many relationships between plants and people.

FINAL NOTE AND CONCLUSION

FINAL NOTE AND CONCLUSION

This dissertation researches into work already done and papers which have touched on the topic and explored current levels of knowledge and understanding. The search, however, for material of worth dealing directly with this topic revealed little.

The subject itself, however, received much recognition in papers which alluded to the importance of nature and plants to people beyond mere physical attributes what the actual effects are have yet to be determined, if in fact they can be made explicit at all.

The effects can be many and varied depending on a number of factors relevant to plants and people and the relationships between them. That effects occur at all can be proven by the use made of plants symbolically throughout human history and the continual importance today of such reference.

Behavioural responses of people to vegetative stimuli was examined in order to determine the well-being gained by people in contact with plants.

Well-being can be defined as, the state of being or doing well in life, a happy, healthy or prosperous condition, welfare or satisfactory condition.

Psychological well-being is the state of health, happiness or welfare of the mind, its functioning and nature.

The contribution of plants to this well-being can be positive in that it heightens existing qualities of well-being. It is suggested also that plants have a healing role in remedying lack of well-being.

As built environments have expanded many human beings have lost the relationship of partnership, involvement with, and participation in the original environment which was natural to them and of which they were part. Many sciences and disciplines are devoted to (a) conservation of what is left of the original environment (or nature) as a resource and (b) reintroducing in some way either in real or in representational fashion, elements of nature or greenness into the built environment.

There is evident fear that in removing people from their natural condition and place people

lose a vital link and that their well-being will suffer.

This is not an idle fear, studies reviewed have touched on social evils that seem inherent in the built environment and progress as it expands extensively in space and intensively in crowding. While these social effects arise from various precipitation factors other than divorce from nature, studies such as Golds shows a healing effect in restoring trees and a natural environment to urban areas. This suggests that the converse, that the absense of vegetation either is a partial cause or could exaccerbate societal breakdown.

There is strong evidence, for example, that hospital patients who have views of trees recover more quickly than those who don't.

Japan Congress: WSA - Economy and Creative Environment pp 87 IFLA (1985)

Practising pyschologists are all too aware of the effect of constant exposure to sterile structures and non living mechanisms on the human psyche. The growth of psychology in all its branches, pyschoanalysis, neural psychology, clinical psychology, industrial psychology and other branches in medicine in coping with psychological disorders underlines human fragility in an environment strange to their basic nature.

Constant research for therapies to restore psychological health in individuals or groups recognises from time to time that part of the problem is that humans are not naturally at home in the megaloplis or minilopolis.

Given that plants and their effect on the psychology of people for their well-being has been largely taken for granted inquiry into this field has therefore been somewhat limited. Application of scientific method has produced persuasive if not conclusive evidence that the natural or wild forms the basic environment structure and that plants as an ingrediant of the environment have a psychological effect.

The photographic testing technique while widely used in seeking favoured environments does not adequately disclose the relationship between people and their environment or between people and plants. A need for further research is evident yet there is a lack of a clear theory in which to base such work. There is a lack also of any simple, tested hands on experiments.

This dissertation has been an exercise in putting together information related to plants and their effects on the human psyche to give a useful understanding of where current

Our new Environmental Design Center at the University of Wisconsin stresses that research findings have identified relationships between the physical environment and human performance; that physiological health and psychological well being are affected by environmental variables; and the social behavior is influenced by enabling elements of the physical environment. Much still remains to be done in giving design interpretation to these many physiological and psychological factors.

Lewis (July 1979) pp 27

research now stands and which points a direction for future research. Such research is on-going and data presented in the basic studies should be picked up and put to use by design professionals.

Mention throughout the discussion of incidentals such as:

garden therapy - where gardening may be more than just a hobby,

colour, shape etc and tensions within and between such design factors which are shown to exact a psychological effect.

may prove useful ingrediants to the landscape designer in synthesising a design.

Environments dominated by plants are perceived by most as a preferable environment, are perceived as valuable in terms of beauty, health, freedom and as marrying attributes of coherence, legibility, mystery complexity to create an overall impression that enhances the well-being of people.

For the landscape architect recognition of such affordances of plants in a person/plant relationship and recognition of differences in appreciation of such by individuals or communities may lead to a better understanding of the possible opportunities and relationships created by vegetation in any design. Vegetation was a dominant part of the original environment, the first human habitat, our home. In it's limited guise in todays built environment it may still create an ambient framework in which there may arise a heightening of the persons mental and physical stature and in which the person can function with a wholeness more befitting the human condition.

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